DEPÓSITO LEGAL ppi 201502ZU4666
Esta publicación científica en formato digital es continuidad de la revista impresa
ISSN 0041-8811

Revista de la Universidad del Zulia

Fundada en 1947
por el Dr. Jesús Enrique Lossada

Ciencias Exactas Naturales y de la Salud

Año 12 N° 33
Mayo - Agosto 2021
Tercera Época
Maracaibo-Venezuela

DOI: http://dx.doi.org/10.46925//rdluz.33.23

The prevalence of parental self-medication practice in Volgograd

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ABSTRACT

The aim of the study is to study the prevalence, determinants, and reasons for parents using oral medications to treat their children in Volgograd (Russia). **Materials and methods.** An instant simultaneous cross-sectional anonymous survey of 390 mothers of children aged 1 to 14 years was conducted during October-March 2018-2019 in the city of Volgograd (Russia). **Criteria for inclusion in the study**: mothers of children older than 1 year. **Exclusion criteria:** other legal representatives of children (fathers, grandmothers, guardians, etc.); women with one child under the age of 1 year; mothers of children with chronic diseases; persons with medical education. The data obtained were analyzed using the STATISTICA-10 software package. To build models of logistic regression, the Student t-test was evaluated for independent samples (to assess the differences between the obtained data) and the $\chi 2$ criterion for the assessment of categorical differences. **Results:** it was found that 71.0% of mothers used the practice of self-medication of children, while its frequency depended only on the level of family income ($\chi 2 = 7.077$, $p = 0.030$) and did not depend on the age of the respondents ($\chi 2 = 0.211$, $p = 0.976$), education ($\chi 2 = 2.626$, $p = 0.270$), the number of children in the family ($\chi 2 = 2.819$, $p = 0.421$). Most often, antipyretic drugs (93.8%), decongestants (72.9%), antiallergic drugs (49.5%), enterosorbents (44.4%), immunomodulators (26.7%), antibiotics (7.9%) were used for self-medication. Using the logistic regression model, it was shown that the main determinant of self-medication in children is delayed treatment of parents for medical help (OR = 0.27, $p < 0.001$). **Conclusion.** The high frequency of self-medication dictates the need for further research to understand this phenomenon.

KEY WORDS: self-medication; children; parent role.

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Recibido: 22/01/2021 Aceptado: 19/03/2021

Prevalencia de la práctica de la automedicación de los padres en Volgogrado

RESUMEN

El objetivo del estudio es estudiar la prevalencia, los determinantes y las razones por las que los padres usan medicamentos orales para tratar a sus hijos en Volgogrado (Rusia). Materiales y métodos. Se realizó una encuesta anónima transversal simultánea instantánea de 390 madres de niños de 1 a 14 años durante octubre-marzo 2018-2019 en la ciudad de Volgogrado (Rusia). Criterios de inclusión en el estudio: madres de niños mayores de 1 año. Criterios de exclusión: otros representantes legales de los niños (padres, abuelas, tutores, etc.); mujeres con un hijo menor de 1 año; madres de niños con enfermedades crónicas; personas con educación médica. Los datos obtenidos se analizaron mediante el paquete de software STATISTICA-10. Para construir modelos de regresión logística, se evaluó la prueba t de Student para muestras independientes (para evaluar las diferencias entre los datos obtenidos) y el criterio $\chi 2$ para la evaluación de diferencias categóricas. Resultados: se encontró que el 71,0% de las madres utilizaba la práctica de la automedicación de los hijos, mientras que su frecuencia dependía solo del nivel de ingreso familiar ($\chi 2 = 7.077$, $p = 0.030$) y no dependía de la edad de los encuestados. ($\chi 2 = 0.211$, $p = 0.976$), educación ($\chi 2 = 2.626$, $p = 0.270$), el número de hijos en la familia ($\chi 2 = 2.819$, $p = 0.421$). Para la automedicación se utilizaron con mayor frecuencia antipiréticos (93,8%), descongestionantes (72,9%), antialérgicos (49,5%), enterosorbentes (44,4%), inmunomoduladores (26,7%), antibióticos (7,9%). Utilizando el modelo de regresión logística, se demostró que el principal determinante de la automedicación en los niños es el retraso en el tratamiento de los padres por ayuda médica (OR = 0,27, p <0,001). Conclusión. La alta frecuencia de la automedicación dicta la necesidad de realizar más investigaciones para comprender este fenómeno.

PALABRAS CLAVE: automedicación; niños; papel de padre.

Introduction

Every child has the right to free medical care in the Russian Federation, which is provided in state and municipal healthcare institutions in the manner prescribed by the legislation of the Russian Federation (Article 10 of the Federal Law of July 24, 1998 No. 124 - FZ "On Basic Guarantees of the Rights of the Child in the Russian Federation") (On basic guarantees of the rights of the child in the Russian Federation, 1998).

According to the WHO definition, the term self-medication is understood as the rational use by the patient himself of drugs on the market for the prevention or treatment of lung diseases before providing professional medical care (World Health Organization:

Guidelines for the regulatory assessment of Medicinal Products for use in self-medication, 2000). In practice, the concept of self-medication also includes the treatment of other family members, including children (Du and Knopf, 2009; Eldalo, 2013). Children are more often consumers of drugs than adults, which is due to both the anatomical and physiological characteristics of the child's body and the structure of their incidence (Santos et al., 2009). The most common medications in pediatrics are antipyretics and antibiotics (Sharif et al., 2015).

If the child's parent (guardian) gives him a medication, then he assumes all the risks associated with its use. How and in what ways parents treat their child, how well they follow the recommendations set out in the instructions for drugs - all these questions lie in the ethical and legal field of possible violations of the rights of the child (Lantos, 2015; Araujo, 2019). Improper use of drugs can be dangerous for children, since the stages of absorption, metabolism, excretion, and even exposure in child acceptors are different compared to adults (Pediatric dosage handbook, 2009).

Attitude to self-medication in pediatrics splits into two clearly opposite poles of opinion. On the one hand, most media articles, Internet sites, television and radio broadcasts continuously encourage parents to self-medicate in the field of pediatrics. The phrase “see a doctor immediately at the first sign of a disease” is most appropriate for pediatric practice. Doctors - pediatricians are also only negative about the possibility of self-medication of children. Health managers also consider the practice of self-medication categorically unacceptable. At the same time, the few studies available show that a significant proportion of parents independently give medicines to their children without a doctor’s prescription (Umerova et al., 2010; Alekseeva et al., 2017; Kulik et al., 2019).

Responsible self-medication has been officially recognized abroad and is considered as part of the modern healthcare system aimed at developing the population’s responsibility for their health, improving education on self-help and self-prevention, allowing citizens to realize the right to independently protect their health (Sonam et al., 2011). The introduction of the concept of self-medication in the Russian Federation is still undergoing a stage of public discussion, and these issues in pediatrics remain poorly understood (Reutskaya et al., 2006; Okonenko et al., 2009). Data from 140 studies conducted worldwide were analyzed in the most comprehensive systematic review of global self-medication practices

presented by Dnyanesh Limaye in 2017, however, not a single Russian study was included in this meta-analysis (Dnyanesh Limaye, 2017).

The aim of the study is to study the prevalence, determinants and reasons for using oral medications to treat children with parents living in the city of Volgograd.

1. Methods

1.1. Study design

A cross-sectional anonymous study was conducted from October 2018 to March 2019 in Volgograd (Russia).

1.2. Study conditions

Prior to the study, positive permission was obtained from the Regional Research Ethics Committee (registration number IRB 00005839 IORG 00049000) at the State Institution "Volgograd Medical Scientific Center", protocol No. 111 of 04/05/2017.

Mothers of children - patients aged 1 to 14 years, who were admitted for treatment to the Volgograd Regional Children's Clinical Infectious Diseases Hospital, were selected by simple random sampling. If the mother had other children, then information was collected only about the child admitted to hospitalization.

Each randomly selected mother who gave preliminary oral consent to the questionnaire received an envelope from the representative of the research group, including an information sheet, an informed consent form, a questionnaire. The information sheet indicated the objectives and methodology of the study; it was also reported to everyone that the study was voluntary and anonymous and that information about the study participant would not be personally identifiable; it was reported that the participation was free of charge (neither the researchers nor the respondents receive any remuneration and preferences for participating in the study).

Each profile consisted of two sections. The first included data on the main demographic characteristics of respondents (age, level of education, number of children, level of material income of the family). The second section contained questions of a medical nature, including the number of episodes of acute infectious diseases in a child over the previous year, tactics of parents' behavior in case of a disease, trust in the appointments of a

local pediatrician, and the practice of using oral medications independently without a doctor's appointment.

1.3.Compliance criteria

To obtain the most uniform data from all legal representatives in the study, it was decided to include only mothers with children older than 1 year. This decision was made due to the fact that mothers, more than other family members, take part in the upbringing, care and treatment of children. The presence of children older than 1 year implies that the mother has a certain experience in caring for a sick child.

Inclusion Criteria:

- ✓ mothers of children over the age of one year of life;
- ✓ permanent residence of the child in the family with parents;
- ✓ the absence of documented chronic diseases in the child;
- ✓ lack of parents' (mother / father) of medical education.

Non-inclusion criteria

- ✓ mothers with children under 1 year old and over 14 years old;
- ✓ the presence of a child's chronic (including allergic) diseases;
- ✓ other representatives of the child (fathers, grandmothers, guardians, etc.);
- ✓ the child does not live in the family (in childcare facilities with a round-the-clock stay, in the family of grandmothers, other relatives, acquaintances);
- ✓ at least one parent has a medical education);
- ✓ persons who refused to answer the questionnaire.

1.4. Description of compliance criteria

The criteria for compliance / non-compliance in all cases were established by the researcher based on the collection and analysis of anamnestic data.

1.5. Targets

The main indicator of the study was considered the proportion of parents who answered positively to the question about the use of oral medications for the treatment of children's health disorders before providing professional medical care.

1.6. Target measurement methods

Each woman who met the inclusion criteria and agreed to conduct a survey received a questionnaire, which consisted of two sections. The first part included 4 questions about the main demographic characteristics of the respondents (age, level of education, number of children, level of material income of the family) and the question "Do you give any medicine to your child yourself without consulting a doctor". The second part of the questionnaire contained 10 medical questions characterizing the process of self-medication; questionnaires only for positive respondents were taken into account. The following criteria were evaluated: the number of episodes of acute infectious diseases in a child for the previous year, the tactics of parents' behavior in case of a disease, confidence in the appointments of a local pediatrician, self-medication frequency for the previous year, causes of self-medication, the main symptoms in which parents resorted to it, medications and side effects, self-medication satisfaction.

1.7.Statistical Procedures

1.7.1. Principles for calculating sample size

The sample size was determined before the start of work. The size of the required sample was 384 people, taking into account a confidence interval of 95%, and a possible 5% error. In fact, 407 questionnaires were distributed, of which 17 were ruined or incorrectly executed. Thus, 390 questionnaires were subjected to statistical processing.

1.7.2. Statistical methods

Statistical analysis of the obtained data was carried out using the STATISTICA program, version 10.0 (StatSoft Inc., USA). To assess the quantitative indicators, we used the determination of the mean value of the sign, standard deviation, median, t-student criterion with a confidence interval of 95%. To evaluate nonparametric parameters, Student t-test was used for independent samples, Pearson's criterion $\chi 2$ at $p < 0.05$.

The influence of independent variables on the indicator of interest to us (the positive practice of self-medication) was assessed by constructing a model of multivariate logistic regression. To this end, variables reaching $P \leq 0.25$ in a two-dimensional analysis were included in the multivariate direct logistic regression model. In this case, the following

characteristics evaluated in the point system were evaluated: age of full years (18-25 years - 1, 26-30 years - 2, 31-35 - 3, older than 36 years - 4 points); the level of education was evaluated in 3 categories (secondary -1; secondary special - 2, higher - 3); the number of children in four categories (one - 1, two - 2, three - 3, four or more - 4); the frequency of episodes of acute infectious disease during the previous twelve months (2-3 episodes - 1, 4-6 times - 2, 7 or more times - 3); see a doctor on the first day of the disease (yes - 1, not always - 2, never - 3); trust in appointments of the local pediatrician (yes, always - 1, no, never - 2, not always - 3 points). The results of the logistic regression model were presented as adjusted odds ratio (OR) coefficients taking into account 95% confidence intervals (CI). P ‹0.05 was taken as a statistically significant level of probability.

2. Results

563 participants were interviewed in the preliminary selection, 156 of them did not meet the inclusion criteria, 407 mothers agreed to participate in the survey. 17 of these questionnaires were found to be incorrectly completed (damaged). Thus, the total number of respondents evaluated was 390 people. 277 of them indicated that they independently give medicine to children in case of their illness without consulting a doctor, which amounted to 71.0% (group I); 113 women answered negatively to the question posed - 29.0% (II group of respondents).

We can conclude from the data presented in table 1 that both groups of parents were very close in basic sociological characteristics. Women aged 25 to 35 years (61.4 and 62.8%), with 1 or 2 children (88.1 and 86, 7%), with higher education (55.6 and 46.9% for groups, respectively) prevailed in both groups. In the first group, 17.3% of respondents had below-average income, in the second - 13.3%; above average 7.2 and 14.1%, respectively. However, the study of differences by the $\chi 2$ criterion showed that the level of family income in the group of mothers practicing self-medication was significantly lower ($\chi 2 = 7.077$, $p < 0.05$).

We analyzed data on the incidence of children, while 60.3% of respondents in the first group reported that in the year preceding the study, their child suffered from 2 to 3 episodes of SARS, 30.3% indicated 4-6, and 9, 3% replied that their child had more than 7

times with acute respiratory infections. In the comparison group, these were 66.1%, 25.7%, and 6.2%, respectively ($\chi 2 = 2.359$, $p = 0.308$).

The main demographic characteristics of the respondents are presented in Table 1.

Table 1. Demographic characteristics of respondents

Characteristic Feature	Self-medication practice			
	Yes (I group)		No (II group)	
	absolute	%	absolute	%
Age				
18-25 years old	49	17,7	19	16,8
26-30 years old	81	29,2	32	28,3
31-35 years old	89	32,1	39	34,5
36 years and older	58	20,9	23	20,4
Values of $\chi 2$ criterion between groups 0.211, $p = 0.976$				
Amount of children				
1 child	124	44,8	59	52,2
2 children	120	43,3	39	34,5
3 children	22	7,9	11	9,7
4 and more children	11	4,0	4	3,5
Values of the $\chi 2$ criterion between groups 2.819, $p = 0.421$				
The level of education				
Secondary education	47	17,0	21	18,6
Vocational education	76	27,4	39	34,5
Higher education	154	55,6	53	46,9
The values of the $\chi 2$ criterion between groups of 2.626, $p = 0.270$				
Family income				
Below the average	48	17,3	15	13,3
Middle	209	75,5	82	72,6
Above the average	20	7,2	18	14,1
Values of $\chi 2$ criterion between groups 7.077, $p = 0.030$				

It was found that parents practicing self-medication were 2 times less likely to seek medical help immediately after the illness of the child. To the question: "Do you always see a doctor on the first day of illness?" in the first group, the following answers were received: yes, always - 30.7%, not always - 65.3%, no, never - 3.9%. In the group not practicing self-medication, those were 64.6%, 33.6% and 1.7%. These differences were statistically significant ($\chi 2 = 9.21$, $p < 0.001$).

To the question "Do you trust the appointments of your local doctor?" 149 (53.8%) of the respondents in the first group answered "yes", "not always" - 11.9% (33) and "no, never" - 34.3% (95 women). In the comparison group, the level of trust was significantly lower, and the answers were distributed as follows: "yes" - 70.8% (80), "not always" -24.8% (28), "no" - 4.4% (5 people) ($\chi 2 = 10.87$, $p = 0.005$).

To assess the most common causes of self-medication, respondents were asked to select all or several reasons why the mother gave the medicine to the child without consulting a doctor (Table 2).

Table 2. Factors associated with self-medication in children

№	Reasons for the independent use of medicines Familiar Symptoms	Number of respondents responding positively	
		absolute	%
1	The desire to alleviate the condition of the child before the doctor's visit	160	57,8
2	Sudden onset of symptoms at night	118	42,6
3	Not a serious condition of the child (does not cause anxiety)	100	36,1
4	Confidence that the doctor will prescribe these drugs anyway	71	25,6
5	There is no way to visit the clinic on the day of illness of the child	58	20,9
6	Use of the medicine that remains of the last time	29	10,5
7	Reasons for the independent use of medicines	18	6,5

It can be seen from the data that the most frequent reason for giving the child self-medication was the appearance of familiar symptoms (57.8%), the desire to help the child before the doctor's visit (42.6%) and her sudden appearance at night (36.1%). Parents indicated that they gave drugs to the child in the absence of alarming symptoms in only 25.6% of the questionnaires, and 10.5% indicated that they could not visit the clinic. Eighteen mothers (6.5%) resorted to the use of drugs that remained in the home medicine cabinet after treatment for previous episodes of acute respiratory viral infections, 58 people

(20.9%) were sure that they knew all the drugs that pediatricians prescribed for them in case of acute respiratory infections.

To the question "How often do you independently give medicine to a child without consulting a doctor", 27.1% said that they do it once a year, 29.9% - 2 times a year, 8.3% - once a month, and 34.6% of women indicated that they do this all the time (always when the child falls ill).

The next step in our work was the evaluation of a set of drugs used for self-medication. For this purpose, mothers were offered a choice of a list of 12 groups of medicines, and it was necessary to choose all the drugs that at least once the mother gave the child without medical prescriptions. The data obtained are presented in Fig. 1.

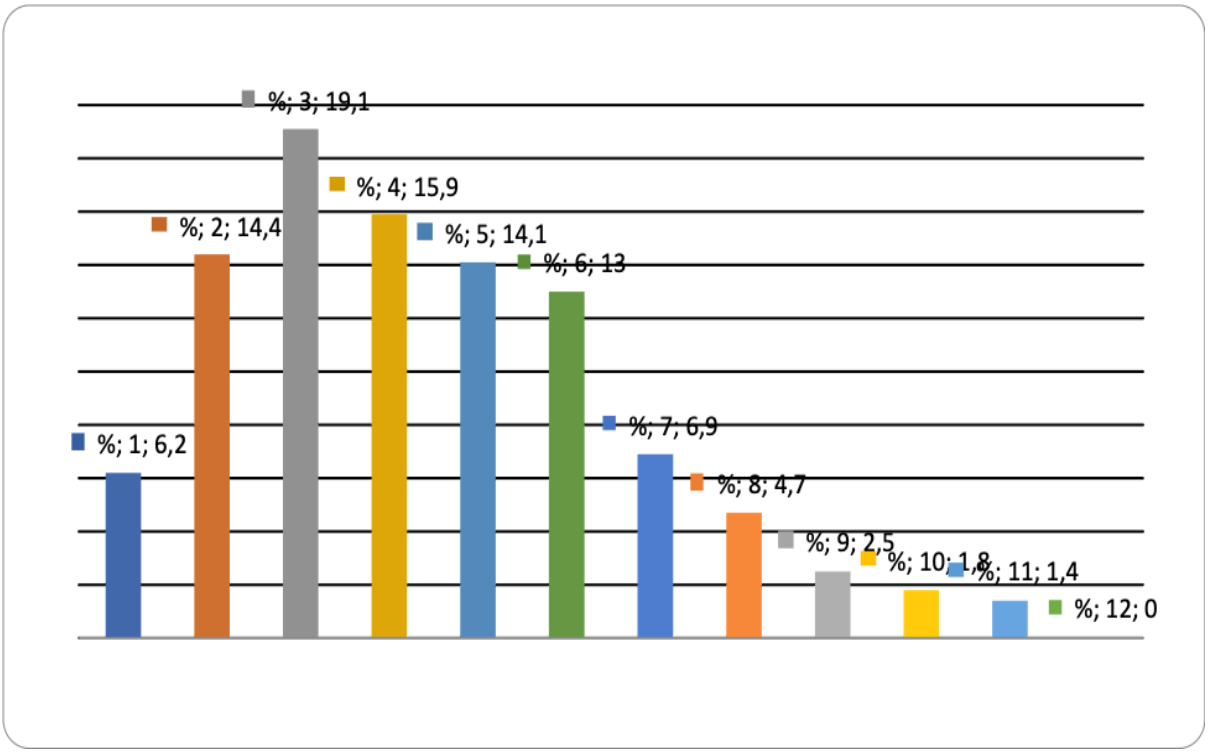

Figure 1. The number of drugs used by parents for self-treatment of children (%)

It was found that 6.1% of mothers surveyed gave the child 1 drug, 14.4% of the respondents gave 2 drugs. The absolute majority indicated in answers to 3 or more groups of drugs. The average number of drugs used by mothers for self-treatment was 6.5 medicines of various groups (CI 95% 2.55 - 6.12), which indicates a wide range of drugs used.

From the data in table 3 it follows that most often parents gave their children antipyretic drugs (93.8%), decongestants (72.9%), antiallergic drugs (49.5%), enterosorbents (44.4%). The following fact is also of concern: 22 mothers (7.9%) indicated the independent use of antibiotics, and 74 (26.7%) indicated the use of immunomodulators.

Table 3. Frequency of parental use of drugs of various groups

№	The group of drugs noted by the respondent in the questionnaire	The number of parents using drugs for self-treatment of children	
		absolute	%
1	Drugs to lower the temperature (ibuprofen, acetaminophen, etc.).	260	93,8
2	Antitussive drugs (ambroxol, acetylcystein, etc.)	115	41,5
3	Vasoconstrictor drops in the nose	202	72,9
4	Herbal medicines (including herbal preparations)	43	15,5
5	Antibiotics	22	7,9
6	Vitamins	110	39,7
7	Immunomodulators (isoprinazine, arbidol, anaferon, etc.)	74	26,7
8	Antiallergic drugs	137	49,5
9	Probiotics (bifidobacteria and lactobacilli)	75	27,1
10	Antispasmodics	32	11,5
11	Pancreatic enzymes	30	10,8
12	Enterosorbents (smecta, activated carbon, enterosgel, etc.)	123	44,4

Satisfaction of parents with self-medication can be regarded as average, because only a third of parents (37.5%) were completely satisfied with its results, while 61.7% did not always get the desired result, 0.7% of respondents were not satisfied with self-medication.

Assessment of pair correlation coefficients showed the presence of a relationship with the level $P \leq 0.25$ for the following parameters: education ($p = 0.238$), income ($p = 0.028$), the frequency of acute respiratory viral infections during the last year ($p = 0.244$),

date of visit to the doctor in in case of acute illness (p = 0.001), the degree of trust in the attending physician (p = 0.06). These indicators were used to build a logistic regression model. The data obtained are presented in table 4.

Table 4. Logistic regression model of potential determinants of self-medication

Study factor	Odds ratio OR	Confidence interval (95% CI)	P value
The level of education	0,86	0,63-1,17	0,351
Family income	1,64	1,02-2,66	0,040
The frequency of acute respiratory diseases in the year preceding the survey	0,77	0,52-1,13	0,184
Seeing a doctor on the first day of illness	0,27	0,17-0,43	<0,001

The results of multivariate logistic regression analysis showed that only one factor was identified as being significantly related to parental self-medication - the practice of consulting a doctor on the first day of a child's disease (OR 0.27, p <0.001); while such characteristics as the level of education, family income, high incidence rates of children were not potential determinants of the use of drugs without a doctor's prescription.

3. Discussion

3.1. Summary of the main research result

The data obtained showed that the majority of mothers (71%) resort to self-medication of their children in case of acute respiratory infections.

3.2. Study Limitations

According to the results of studies conducted abroad, the level of self-medication of the population significantly depends on socio-economic conditions and the main factor of this phenomenon is financial restrictions, in particular, the lack of medical insurance and the high cost of medical services (Al-Ghamdi et al., 2020; Aoyama et al.,, 2012; Awad et al.,

2006; Chang and Pravin, 2003; Pagán et al., 2006; Torres et al., 2019; Urrunaga-Pastor et al, 2019). When evaluating our results, it is absolutely necessary to take into account the cultural and socio-economic differences between the studied populations, as well as the differences between the world's health systems, since these factors affect access to medical care and medicines, their use.

3.3. Interpretation of study results

It was established that, despite the fact that medical care in the Russian Federation is public and free, treatment by parents of children without consulting a doctor is common practice (71%), and 34.7% of mothers are constantly self-medicating, which is comparable to obtained in foreign studies. Perhaps for children with chronic diseases this figure will be significantly higher. It was found that self-medication is not affected by factors such as the mother's age, her level of education, and the child's susceptibility to frequent respiratory infections.

Only 2 factors, such as family income and the practice of seeking medical help on the first day of a child's illness, affect the frequency of self-medication: parents with high family income are less likely to self-medicate, while those who choose the tactics of monitoring the course of the disease in a child are more likely to use drugs without consulting a doctor. The absolute determinant of self-medication can only be considered a behavioral habit to ignore seeking medical help immediately (on the first day) after a child's illness.

Conclusion

The established high level of self-medication use dictates the need for informational and educational activities for parents, including the provision of first aid in the event of an acute illness in a child. In addition, further cross-sectional studies of self-medication are needed to understand the prevalence of this phenomenon in the population.

Conflict of Interest Statement

The authors confirmed the absence of a reportable conflict of interests.

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