PARENTS' AWARENESS OF SAFE PHARMACOTHERAPY IN CHILDREN

INFORMOVANOST RODIČŮ O BEZPEČNÉ FARMAKOTERAPII U DĚTÍ

Gabriela Světnická[1], Daniela Nedvědová[1]

Abstract

Objective: The objective of the work was to find out parents' awareness of safe pharmacotherapy in children.
Methodology: A quantitative survey with a non-standardized questionnaire was used to process the work. The research group consisted of parents.
Results: Knowledge questions showed that parents have a good knowledge of drug dosing, the importance of drug administration time, including antibiotic treatment, excellent results were in the knowledge of antipyretic drug group and the time interval between doses, but immediately in another question, which also concerned the combination of antipyretics and the time interval, the same number of parents gave interval 4 and 6 hours, which indicated that the parents were not sure of the correct answer in this regard. Parents had insufficient knowledge of the question that determines the temperature at which we administer antipyretics. The larger half answered incorrectly. Furthermore, by sub-objectives, it was discovered that statistical significance was found in the answers between the groups with secondary education without a high school diploma and with university education in the knowledge of safe pharmacotherapy. A significant difference was also found between self-employed parents and unemployed parents, and it was discovered that the number of children also affected parents' knowledge and experience.
Conclusion: In many cases, the parent is most often present with the child, especially during the period when the child becomes ill and it is necessary to give the child medication and visit a doctor. For this reason, it would be appropriate to systematically educate parents about the safe administration of medication to children.

Keywords

parent, pharmacotherapy, child, education

[1] Institute of Non-medical Healthcare Studies, Faculty of Public Policies in Opava, Silesian University in Opava

Abstrakt

Cíl: Cílem práce bylo zjistit informovanost rodičů o bezpečné farmakoterapii u dětí.
Metodika: Ke zpracování práce bylo použito kvantitativní šetření nestandardizovaným dotazníkem. Výzkumný soubor tvořili rodiče.
Výsledky: Znalostní otázky ukázaly, že rodiče mají dobré znalosti o dávkování léčiv, důležitosti času podávání léčiva, a to také u podávání antibiotické léčby, excelentní výsledky byly ve znalosti lékové skupiny antipyretik a také podávání časového intervalu mezi jednotlivými dávkami tohoto léčiva, ale ihned v další otázce, která se také týkala kombinací antipyretik a časového intervalu rodiče uváděli ve stejném počtu interval 4 a 6 hodin což naznačilo, že rodiče si v tomto ohledu nejsou jistí správnou odpovědí. Rodiče měli nedostačující znalosti u otázky, která určuje, při jaké teplotě podáváme antipyretika. Větší polovina odpověděla nesprávně. Dále bylo pomocí dílčích cílů zjištěno, že statistická významnost byla nalezena u odpovědí mezi skupinami se středním vzděláním bez maturity a vysokoškolským vzděláním ve znalostech o bezpečné farmakoterapii. Signifikantní rozdíl byl také nalezen mezi rodiči OSVČ a nezaměstnanými rodiči a bylo zjištěno, že také počet dětí ovlivnil znalosti a také zkušenosti mezi rodiči.
Závěr: Právě rodič je v mnoha případech přítomen u dítěte nejčastěji, a to hlavně v období, kdy dítě onemocní a je nutné dítěti podat léky a navštívit lékaře. Z tohoto důvodu by bylo vhodné rodiče systematicky edukovat o bezpečném podávání léků dětem.

Klíčová slova

rodič, farmakoterapie, dítě, edukace

INTRODUCTION

The ability of parents to administer medication to their children is essential for the proper management of children's treatment. Parents should be instructed to administer the medicine prescribed by their doctor for the entire duration of the treatment and it is not advisable to stop treatment even if the child's condition improves. In some cases, it is necessary to combine drugs and parents must be properly educated in this regard (Wembonyama, 1998). Problems associated with drug administration in children are most often associated with a lack of information regarding the safety and efficacy of drugs administered (Salas et al., 2016). Medicinal products are subject to an approval process, which is often intended for use by adults, each medicinal product must be subjected to extensive testing, including pre-clinical tests and clinical trials, to determine

that the drug is safe and effective (Caldvel et al., 2004). Unfortunately, the same does not apply to medicines used to treat children. Serious concerns about harm to pediatric patients stem from the fact that around 70 % of medicines used in pediatric care in the EU in one or more age groups are under-studied. In neonates, this percentage of unlicensed drugs and their use is even higher, up to 80–90 % (Conroy et al., 2000 and Vulto et al., 2000). Adults and children alike are exposed to drug-drug interactions when taking medications, which can change the concentration of the drug. This process can be caused by a change in absorption, distribution, metabolism and elimination, and for this reason it is necessary to conduct research in this area and properly educate parents (Mahmod, 2020).

OBJECTIVE:

To find out parents' awareness of safe pharmacotherapy in children.

Sub-objectives:

1. To find out whether the education of parents influences the knowledge of safe pharmacotherapy in children.
2. To find out whether the employment of parents affects the knowledge of safe pharmacotherapy in children.
3. To find out whether the number of children in the family affects the knowledge and experience with drug administration.

Research group and methodology

The research group consisted of parents of children who come to the children's ward of Silesian Hospital in Opava, to accompany their children, as well as parents of students of the combined form of study of general nurse at the Institute of Non-medical Healthcare Studies. A total of 150 questionnaires were distributed, of which 11 did not return and 9 questionnaires were discarded due to incorrect or incomplete completion of data. 130 questionnaires returned, which was 86.66 %.

A quantitative survey with a non-standardized questionnaire was used to process the work. The questionnaire was constructed of 33 closed questions and 4 semi-closed questions. There were 18 knowledge questions about safe pharmacotherapy in children. Furthermore, the questionnaire was supplemented by demographic questions, which allowed to characterize a sample of respondents. The respondents were asked to mark one correct answer, some answers could be completed by the respondents. Data collection took place at the Children's Department of the Silesian Hospital in Opava and at the Institute of Non-Medical Healthcare Studies of the Faculty of Public Policy in Opava from May to September 2021.

The results of the questionnaire survey were processed in Microsoft Office Excel 2007 and Microsoft office Word 2007. The results are shown in the tables.

Results and discussion

The main goal of the research was to find out parents' awareness of safe pharmacotherapy in children. The following results were evaluated regarding the main goal.

Tab. 1 Do you think the dose of medicine you give your child must have…?

	Frequency	Cumulative	Rel.frequncy	Cumulative
Exact amount according to the child's weight	40	40	30,76923	30,7692
Exact amount according to the child's age	13	53	10,00000	40,7692
Both of the above apply	77	130	59,23077	100,0000
Total		130		100,0000

Parents' knowledge ***of drug dosing*** is shown in Table No. 1. Out of the total number of 130 respondents (100 %), 77 respondents (59.23 %) answered that both were true, i. e. that the dose of the drug is determined by the weight and age of the child. Other results are shown in the tabular form, where the frequency of responses, the cumulative frequency of responses, the relative and cumulative frequency of responses are shown. The left column lists the answer options for parents.

Tab. 2 In your opinion, is the time of drug administration in children…?

	Frequency	Cumulative	Rel.frequncy	Cumulative
Very important	104	104	80,00000	80,00000
Is not that important	19	123	14,61538	94,6154
Is not important at all	7	130	5,38462	100,0000
Total		130		100,0000

Parents' knowledge ***of the importance of drug administration time*** is shown in Table No. 2. Out of the total number of 130 respondents (100 %), 104 respondents (80 %) answered that the time of drug administration is very important. Other results are shown in the tabular form, where the frequency of responses, the cumulative frequency of responses, the relative and cumulative frequency of responses are shown. The left column lists the answer options for parents.

Tab. 3 If your child is taking antibiotics, do you stick to the prescribed administration times?

	Frequency	Cumulative	Rel.frequncy	Cumulative
Allways	112	112	86,15385	86,1538
Never	7	119	5,38462	91,5385
Sometimes I forget, miss a dose	11	130	8,46154	100,0000
Total		130		100,0000

Parents' knowledge ***of the time interval of antibiotic use*** is shown in Table No. 3. Out of the total number of 130 respondents (100 %), 112 respondents (86.15 %) answered that they always stick to the time of antibiotic administration. Other results are shown in the tabular form, where the frequency of responses, the cumulative frequency of responses, the relative and cumulative frequency of responses are shown. The left column lists the answer options for parents.

Tab. 4 Drugs against temperature are generally administered in a time interval ... (if only one drug is administered, it is not a combination of two drugs).

	Frequency	Cumulative	Rel.frequncy	Cumulative
Every 2 hours	18	18	13,84615	13,8462
Every 4 hours	33	51	25,38462	39,2308
Every 6 hours	59	110	45,38462	84,6154
Every 8 hours	20	130	15,38462	100,0000
Total		130		100,0000

Parents' ***knowledge of the time interval of antipyretics*** is shown in Table No. 4. Out of the total number of 130 respondents (100 %), 59 respondents (45.38 %) answered that antipyretics are given every 6 hours. Other results are shown in the tabular form, where the frequency of responses, the cumulative frequency of responses, the relative and cumulative frequency of responses are shown. The left column lists the answer options for parents.

Tab. 5 Do you know what antipyretics are used for?

	Frequency	Cumulative	Rel.frequncy	Cumulative
Against cough	19	19	14,61538	14,6154
Against fever	97	116	74,61538	89,2308
Against diarrhea	14	130	10,76923	100,0000
Total		130		100,0000

Parents' knowledge ***of antipyretic drugs*** is shown in Table No. 5. Out of the total number of 130 respondents (100 %), 97 respondents (74.61 %) answered that antipyretics are drugs against fever. Other results are shown in the tabular form, where the frequency of responses, the cumulative frequency of responses, the relative and cumulative frequency of responses are shown. The left column lists the answer options for parents.

Tab. 6 In what time interval can you combine the medicines Panadol (Paracetamol) and Nurofen (Ibuprofen) in children with fever?

	Frequency	Cumulative	Rel.frequncy	Cumulative
Every 4 hours	53	53	40,76923	40,7692
Every 6 hours	53	106	40,76923	81,5385
Every 8 hours	24	130	18,46154	100,0000
Total		130		100,0000

Parents' knowledge ***of the time interval of the combination of drugs against fever*** is shown in Table No. 6. Out of the total number of 130 respondents (100), in both groups of respondents, 53 (40.76) answered every 4 and 6 hours. Other results are shown in the tabular form, where the frequency of responses, the cumulative frequency of responses, the relative and cumulative frequency of responses are shown. The left column lists the answer options for parents.

Tab. 7 At what temperature do you usually give your child medicines to lower body temperature?

	Frequency	Cumulative	Rel.frequncy	Cumulative
37 °C-37,5 °C	11	11	8,46154	8,4615
37,6 °C-38,4 °C	61	72	46,92308	55,3846
38,5 °C and more	58	130	44,61538	100,0000
Total		130		100,0000

Parents' knowledge ***of the level of fever and the need for antipyretic treatment*** is shown in Table 7. Out of the total number of 130 respondents (100 %), 61 respondents

(46.92%) answered that they would administer antipyretics at a temperature of 37.6–38.4°C. Other results are shown in the tabular form, where the frequency of responses, the cumulative frequency of responses, the relative and cumulative frequency of responses are shown. The left column lists the answer options for parents.

Sub-objective No. 1 was to **determine whether parental education affects knowledge of safe pharmacotherapy in children**. One of the questions was whether parents knew what the most basic drug used in children, namely antipyretics, was used for. **Hypothesis H_1** We were therefore interested in whether the parents answered this question the same regardless of education. There was a significant difference between groups with secondary education without a high school diploma and university-educated parents, $p = 0.027$. Another question is at what temperature we administer drugs designed to reduce body temperature in children. **Hypothesis H_2** We were therefore interested in whether the parents answered this question the same regardless of education. A significant statistical difference was observed between the categories of parents with basic education and university education $p = 0.015$ and also a significant difference was observed in the group of parents with secondary education with a high school diploma compared to university-educated parents, $p = 0.0046$. The author of the research Blackmer et al. (2021, p. 64) found in his research, which focused on parents' knowledge of administering drugs to their children when most children were <10 years old (63.5) and used a median of 8 drugs (IQR, 5–10), that the parents were predominantly women (76.9%) with an average age of 38.8 ± 11.5 years, they spoke English (94.2) and had a university degree (82.1%). Only 73.1% of parents correctly identified the drugs used for the specified conditions, 40.4% reported complete dosing parameters and 54.8% correctly measured 2 different doses of drugs. Significant differences were observed between parents (all $p = 0.05$). The conclusion is that education is needed to improve the safety and efficacy of medicines in outpatient and home settings, including better drug education and drug-related support.

Sub-objective No. 2 was to **determine whether the employment of parents has an impact on knowledge of safe pharmacotherapy in children. Hypothesis H_3** We were therefore interested in whether the parents answered the same regardless of the job classification. There is a significant statistical difference in the question at what temperature we administer drugs designed to reduce body temperature in children, between the categories of self-employed parents and unemployed parents $p = 0.02$. The authors Aref and Barati (2021, p. 92) conducted a research that focused on the use of self-treatment of children by parents. The research took place in the years 2018–2019 in Iran in 270 children who were hospitalized and found out what drugs were given to children from their parents. The results show that 58.5% of children were boys and 41.5% were girls. The mean age of the children was 5.79 ± 4.15 years. Self-treatment was the first choice for 60.4% of parents. Parents treated their children with antipyretics in 31.8%, with herbs in 17.4%, with antibiotics in 11.4%, and 23.5% with other drugs. 91% of parents did not know the correct dose of drugs and 96.3% did not know about possible side effects of drugs, contraindications and preventive measures. There was a statistically significant correlation between parental employment (self-employment)

and self-treatment ($p < 0.05$). The conclusion of this research is that 48.9% of parents chose self-treatment for their children. Of these parents, 91% and 96.3% were unaware of the correct drug dosing and possible side effects, contraindications, and potential risks.

Sub-objective No. 3 was to **determine whether the number of children in the family affects the knowledge and experience with drug administration. Hypothesis H_4** We were therefore interested in whether the parents answered the same regardless of the number of children in the family. A significant difference was found in the question whether parents administer antipyretic drugs in a time interval, between a group of parents without children and with one child, $p = 0.044$.

CONCLUSION

The administration of medicines to children is a common practice, not only in medical facilities. Medicines often have to be given to children by their parents or their caregivers. The main goal of this work was met. The survey concluded that parents' awareness of safe pharmacotherapy in children is insufficient given the seriousness of the topic, so we must inform and educate parents about safe pharmacotherapy in children.

The worst results had the questions regarding the temperature at which antipyretic are administered. Most respondents stated that they will already administer antipyretics at a temperature of 37.6–38.4 ° C, but this temperature does not yet require the administration of antipyretics, we can still use the possibility of non-pharmacological reduction of temperature. Antipyretics are administered at a temperature of 38.5°C and above. Another problematic area was found in the question concerning the possibility of combining antipyretic drugs and the indication of the time interval, parents stated both 4 and 6 hours, so it is clear that the answers to this question are unclear to parents, and therefore the same number chose one of these options. It is necessary for us to focus on these areas when providing information to parents, so that parents' information is at the highest possible level.

The best results were obtained with questions that asked about the dosage of drugs, the importance of their administration and antibiotic treatment, as well as knowledge of the drug group and knowledge of time between administered antipyretics, but only for one drug against fever. In case of time interval and combinations of antipyretic drugs, the parents were not sure about the answer, as mentioned above.

References

AREF, A. and BARATI, L. Frequency of parents' self-medication in children who need medical care in Gorgan, north of Iran (2018–19). *J Gorgan Univ Med Sci*. 2021, vol. 23, no. 2, p. 90–94 [cit. 2021-11-10]. ISSN 15624765.

BLACKMER, A. B. et al. Perceived Versus Demonstrated Understanding of the Complex Medications of Medically Complex Children. *Journal of Pediatric Pharmacology* [online]. 2021, vol. 26, no. 1, p. 62–72 [cit. 2021-11-10]. ISSN 15516776.

CALDWELL, P. H. et al. Clinical trials in children. *The Lancet* [online]. 2004, 364(9436), p. 803–811 [cit. 2021-11-11]. ISSN 01406736.

CONROY, S. et al. Survey of Unlicensed and off Label Drug Use in Paediatric Wards in European Countries. *BMJ: British Medical Journal* [online]. 2000, 320(7227), 79 [cit. 2021-11-11]. ISSN 09598138.

MAHMOOD, I. Prediction of Clearance in Children from Adults Following Drug–Drug Interaction Studies: Application of Age-Dependent Exponent Model. *Drugs in R* [online]. 2020, 20 [cit. 2021-11-11]. ISSN 11796901.

SALAS, R. et al. Adverse drug reactions in hospitalized Colombian children / Reacciones adversas a medicamentos en niños hospitalizados en Colombia. *Colombia Médica* [online]. 2016, 47(3), 142–147 [cit. 2021-11-11]. ISSN 16579534.

VULTO, A. G., K. J. SCHIMMEL a D. TIBBOEL. Unapproved and off-label use of drugs in a children's hospital. *The New England journal of medicine* [online]. 2000, 343(15), 1125 [cit. 2021-11-12]. ISSN 00284793.

WEMBONYAMA, O. [Behavior of African mothers with regard to prescription of medications for sick children]. *Developpement et sante: revue de perfectionnement medical et sanitaire en pays tropical* [online]. 1998, (135), 28–9 [cit. 2021-11-15]. ISSN 03968014.

Contact

Mgr. Gabriela Světnická
Faculty of Public Policies in Opava, Silesian University in Opava
Institute of Nursing
Bezručovo nám. 885/14, 746 01 Opava, Czech Republic
gabriela.svetnicka@fvp.slu.cz