

An evaluation of the poisoning accidents encountered in children aged 0-6 years in Kırıkkale

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SUMMARY: Erkal, S, Şafak, Ş. An evaluation of the poisoning accidents encountered in children aged 0-6 years living in Kırıkkale. Turk J Pediatr 2006; 48: 294-300.

This study was planned with the aims of evaluating poisoning accidents encountered in children aged between 0–6 years, who applied to the H. Hidayet Doğruer Obstetrics and Children's Hospital in Kırıkkale in 2003, and of determining the measures taken by families to prevent further accidents in their homes. Poisoning accidents were concentrated in children aged between 2–3 years. The major causative poisoning agents were determined to be drugs and cleaning agents, and the majority of accidents (34.0%) occurred in the kitchen. It has been determined that most of the poisoning accidents (49.5%) stemmed from storing of drugs within the reach of children. Of all mothers participating in the study, 68.9% declared that they have taken measures to prevent future poisoning accidents in their homes.

Key words: accident, home accidents, childhood poisoning.

The ever-accelerating scientific and technological developments have brought thousands of tons of industrial agents and products to our closest environment as of the second half of the 20th century and have introduced numerous products, ranging from the cleaning agents and cosmetics used in our daily lives, to agricultural agents, veterinary medicines, and drugs used in the cure of disease. Considering the increase in the population, it can be asserted that the continuation of the potential of poisonings, either accidental or intentional, can be accepted as a natural phenomenon. However, the most striking point is the observation that two-thirds of all poisoning accidents occur in children, and that two-thirds of these accidents are concentrated in the group of children less than five years of age¹.

Poisoning, which holds a predominant place in the urgent illnesses seen in children, is a preventable cause of mortality and morbidity². Poisonings account for 2% of the accidental deaths in developed countries and for 5% in developing countries³. Despite all the efforts at prevention, more than one million children under six years of age have been poisoned in the United States. Thirty percent of the children

under six years of age have been the subject of poisoning accidents only once; frequency of the poisonings were concentrated in the group aged 24 months⁴. It has been estimated that some 150,000 poisoning accidents occur yearly in Turkey⁵.

Most of the accidents encountered by children stemmed from inadequate preventive measures taken at home⁶. In rendering the child's environment safer, the family's education, especially that of the mother, is of vital importance⁷. The causative poisoning agents show variation according to country, geographical region, seasons, and to the customs and levels of education of the community⁸.

This study was planned with the aims of evaluating the poisoning accidents encountered in children aged 0–6 years living in Kırıkkale and of determining the measures taken by families to prevent further accidents in their homes.

Material and Methods

This study was conducted in children aged 0–6 years, who applied to the Department of Pediatrics of H. Hidayet Doğruer Obstetrics and Children's Hospital in Kırıkkale because

of poisoning between 1 January 2003 and 31 December 2003. In determining the patients for the scope of this study, the records of the Department of Pediatrics of H. Hidayet Doğruer Hospital were taken into consideration. One hundred and ten children had applied to the hospital in 2003 because of poisoning. However, as there were families who did not want to be interviewed, only 103 families accepted to take part in the study. The data was obtained from a questionnaire developed by the researcher^{7,9,10} and was applied only to the mother. The questionnaire is composed of 16 questions presented in three groupings. The first section consists of questions pertaining to the family of the child who was exposed to the poisoning agents; the second concerns measures the mothers have taken at home; and the third contains questions about the age and sex of the child, the responsible caregiver at the time of the accident, the poisoning agent, reasons for poisoning, and other relevant questions to shed light on the outcome of the poisoning. This was a cross-sectional and descriptive study. As there were seven mothers who were university graduates in the study, they were included in the high school graduate classification. The chi-square and the two sample Kolmogorov-Smirnov tests were used in the statistical analyses.

Results

General Information on the Mothers and Their Children

It was observed that 37.9% of the mothers of the children who were poisoning victims had a primary school or lower level of education, 31.0% secondary school, and 31.1% high school or higher level of education. Regarding maternal age, 40.8% of the mothers were aged between 20-29; 35.9% between 30-39; 17.5% 19 and below, and 5.8% were aged 40+; 79.6% of the mothers were unemployed.

It has been determined that of the poisoning accident victims, 51.5% were boys and 48.5% girls. The children aged 2-3 years constituted the first rank with 48.5%, followed by those aged 4-5 years at 26.2%. Figure 1 clearly shows that children of both sexes aged 2-3 years accounted for the highest ratios (56.0% in the girls' group, 41.5% in the boys') of accident groups, but the data was not significant statistically ($Z=0.657, P=0.782$).

It was also determined that most of the children (67.0%) were under the surveillance of their mothers at the time of the accidents. Of the poisonings occurring while under the supervision of the mother, drugs accounted for the majority at 55.1%, followed by pesticides/insecticides at 17.4%, and cleaning agents at 14.5%.

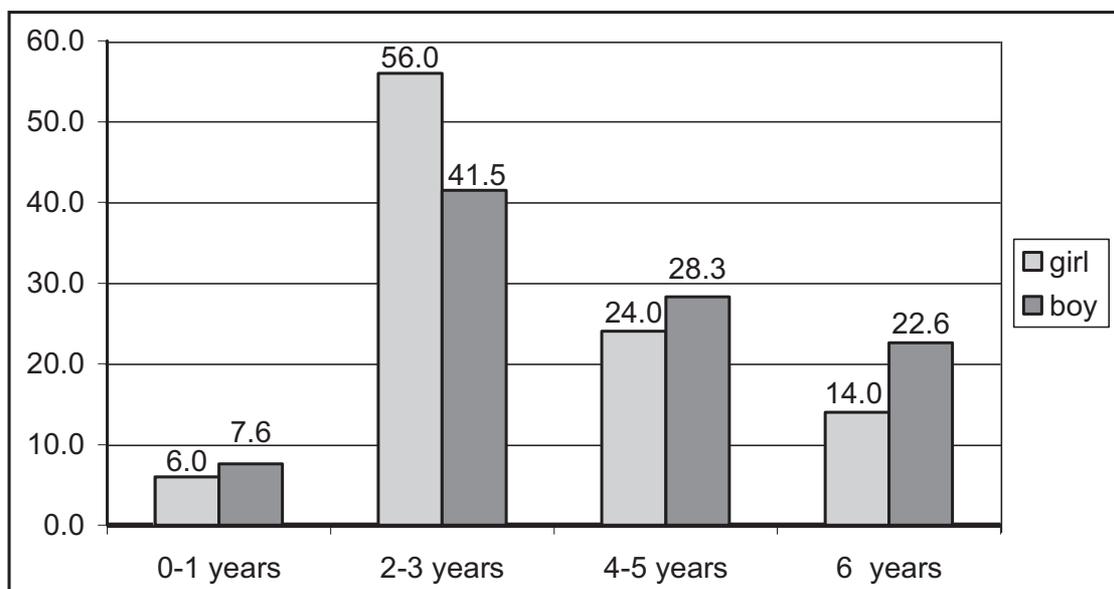


Fig. 1. The distribution of the children according to sex and age.

Characteristics of Poisonings

When location of the poisoning accident was considered, it was determined that 34% occurred in the kitchen, 32.0% in the bathroom, and 20.4% in the children’s bedrooms.

The research demonstrated that 46.6% of the poisoning accidents occurred in spring, 29.1% in summer, 13.6% in winter, and 10.7% during autumn; moreover, most of the poisoning accidents (60.2%) occurred in the morning hours.

Figure 2 indicates the distribution of causative poisonings agents, with the majority due to drugs (49.5%), followed by cleaning agents

(17.5%), and insecticides/pesticides (16.5%). In both sexes, the highest ratio was poisonings with drugs (52.0% in the girls’ group, 47.2% in the boys’); the most frequently reported drugs were analgesics (49.0%) and antidepressants (37.3%). Of the poisonings by cleaning agents, 5.6% were caused by caustic agents (Fig. 3).

As shown in Figure 4, ratios of poisonings with drugs and cleaning agents were the same in the age group 0-1 (42.9%); in the age groups 2-3 (44.0%), 4-5 (66.7%), and 6 (42.1%), drugs were responsible for the majority of the poisoning accidents.

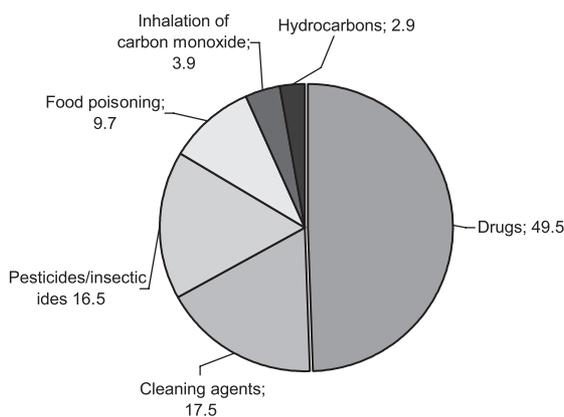


Fig. 2. The distribution of the children according to the poisoning agents.

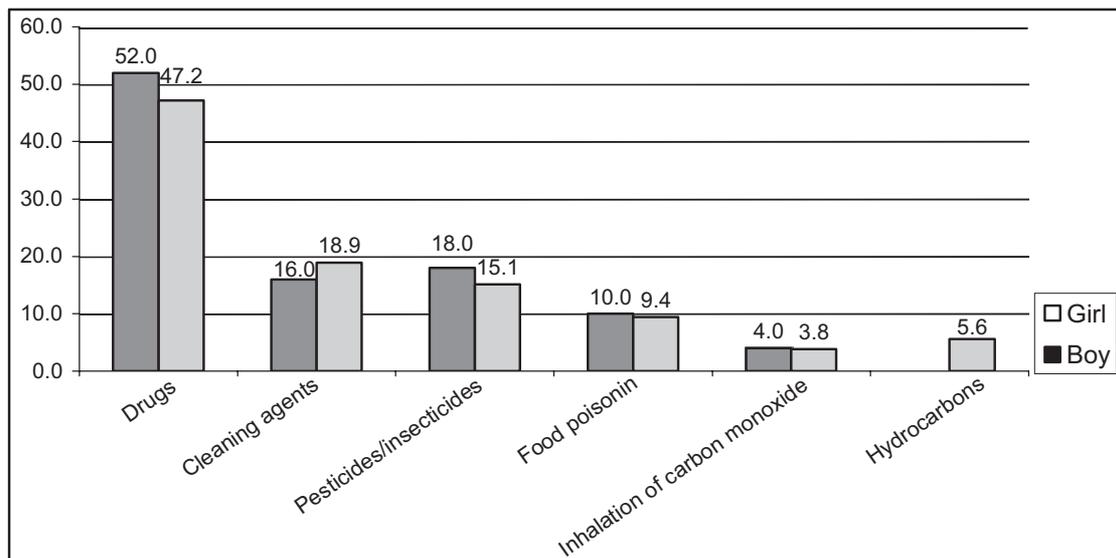


Fig. 3. The distribution of the children according to sex and the poisoning agents.

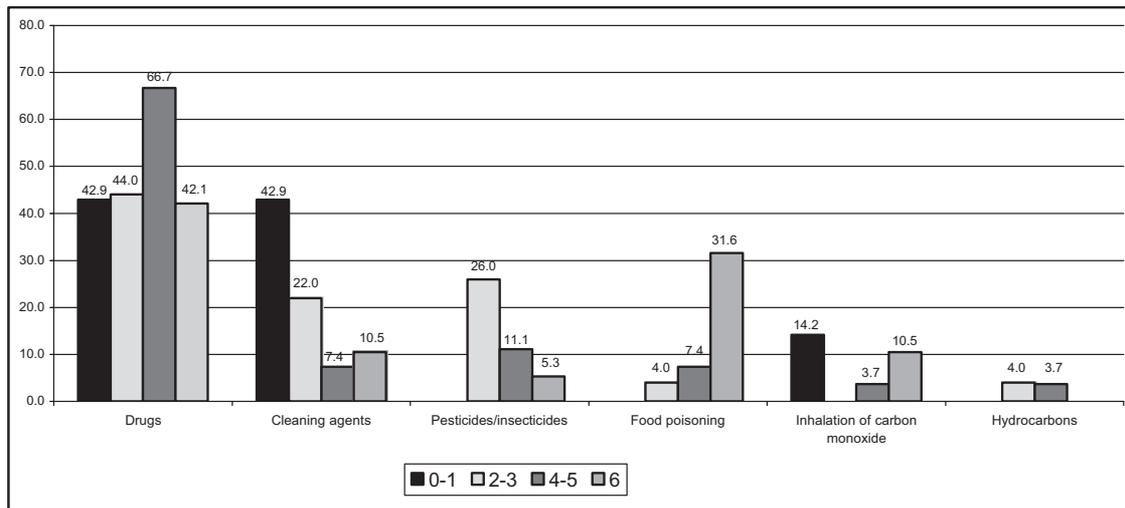


Fig. 4. The distribution of the children according to age and the poisoning agents.

Causes of the Poisonings

It was determined that the storage of drugs within the reach of children (49.5%) and storage of the cleaning agents in other than their original containers and within the reach of children (17.5%) caused the majority of poisoning accidents. Those who reported the accidents claimed that storage of the drugs within the reach of children constituted the highest ratio (52.0% girls, 47.2% boys) (Fig. 5).

Preventative Measures Taken at Home

Approximately 69% of the mothers claimed to have taken measures to prevent future poisoning accidents in their homes. For all educational levels (primary school or less 61.5%; secondary school 62.5%; and high school

and above 84.4%), it can be concluded that as the level of education increases, the ratio of those claiming to take preventative measures increases, and the relation between the level of education of the mothers and their actions to prevent future poisonings was found to be statistically significant ($\chi^2=16.989, P=0.000$).

Of the reported preventative measures taken, the majority reported taking action to keep drugs out of the reach of children (76.1%). Considering all educational levels, measure to keep drugs out of the reach of children constituted the highest ratio (primary school or less 66.7%; secondary school 80%; and high school and above 81.5%). As the level of education increased, the number of mothers who reported efforts to keep the cleaning materials

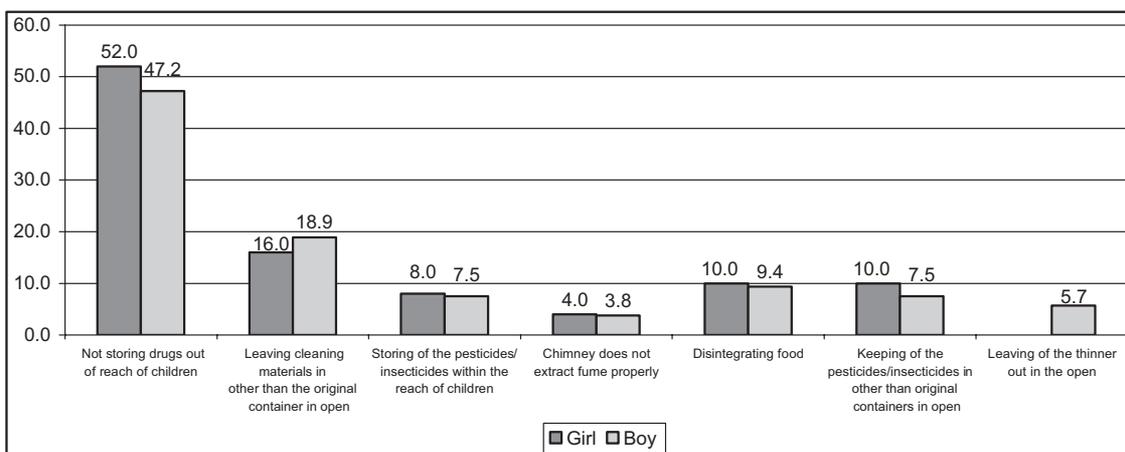


Fig. 5. The distribution of the children according to sex and the reasons for exposure to the poisoning agents.

and insecticides/pesticides out of the reach of children; to not eat mushrooms or other plants collected in the wild; to sufficiently ventilate the environment when the gas heaters were in use; and to pay attention to the expiration dates on food containers also increased (Fig. 6). The relation between level of education and these four preventive measures was found to be statistically significant - $\chi^2=11.833$, $P=0.03$; $\chi^2=10.321$, $P=0.006$; $\chi^2=28.952$, $P=0.000$; and $\chi^2=42.661$, $P=0.000$, respectively. Among the mothers who claimed to have taken preventive measures against poisonings, there was no mention at all of basic precautions such as storage of the poisonous agents on different shelves, storage of drugs and chemicals in locked cupboards, and not consuming drugs in front of children.

Discussion

The previous studies carried out in the field indicate that poisonings are more frequent among boys^{11,12-19}. In this study, it was also observed that the ratio of boys (51.5%) was higher than that of girls (48.5%), which is probably due to the more active and inquisitive nature of boys^{20,21}. The group of children aged 2–3 years accounted for the majority of the poisoned children at 48.5%. Öner et al.²² also showed that most of the applications to hospitals for poisonings were concentrated in the 2–3 years of age group.

The kitchen is a dangerous place for children⁹. Within the scope of this study, the number of accidents in the kitchen constituted the first rank at 34.0%. Laflamme and Petersson²³ and

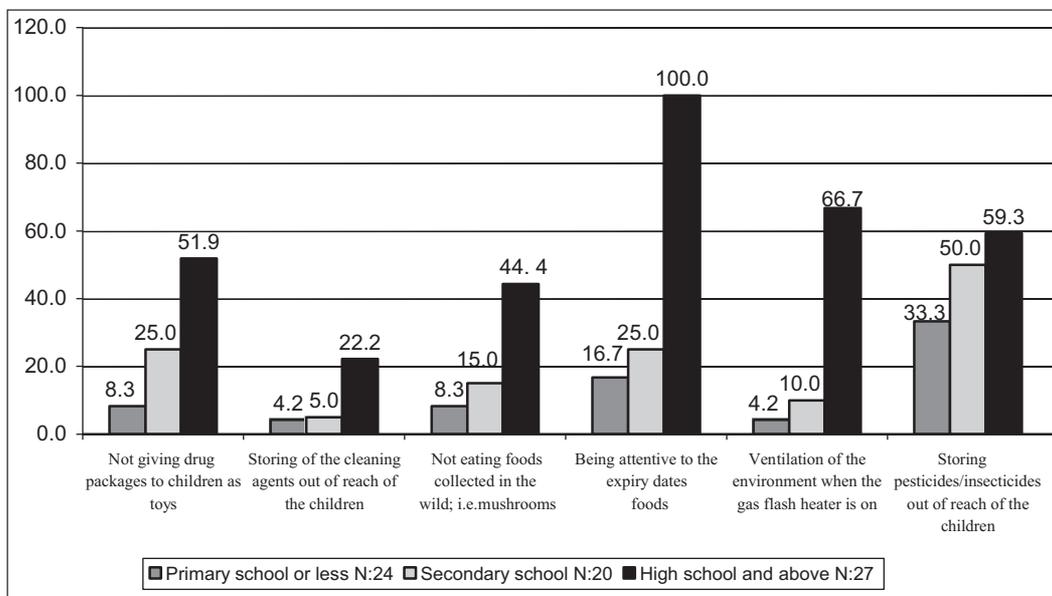


Fig. 6. The distribution of the mothers according to their educational backgrounds and preventive measures taken against poisoning at home.

According to our results, drugs, pesticides/insecticides, and cleaning agents were being stored within the reach of children in unlocked cupboards at rates of 41.8%, 68.0%, and 62.1%, respectively. It was determined that all child victims of the poisoning accidents reviewed in this study had fully recovered at the end of the study period.

Erkal and Şafak²⁴ also reported that most of the poisonings occurred in the kitchen. This can be explained by the fact that drugs and cleaning agents are commonly kept in this room.

In evaluating the studies performed in this field in our country and abroad^{11,13-15,18,25-29}, it has been reported that the primary reasons for poisoning accidents during infancy were the

taking of drugs, and that poisonings stemming from other sources differed in relation to regional characteristics¹⁷. This study also puts forward the conclusion that the most important factor in poisoning accidents is the consumption of drugs (49.5%), followed by poisonings by cleaning agents (17.5%), and insecticides/pesticides (16.5%), respectively, and is explained by their ever-increasing usage in our daily lives and their being improperly stored within reach of the children. Öntürk et al.⁸ reported poisonings due to cleaning agents as second only to the taking of drugs. It has been reported that in the period 1980-1992, 1,751 children aged 0-6 had applied to Odense University Hospital in Denmark because of poisoning accidents, and that 482 of those children were poisoned by chemical agents found in the home¹⁰. In the study of Aji and İler¹⁷ and Tunç et al.¹³, food poisoning; in the studies performed by Özcan et al.²¹ in Aydın, poisonings stemming from oil derived hydrocarbon compounds; in the studies of Orbak et al.¹⁴ organic poisonings; in the study of Çeliker et al.³⁰, poisonings from pesticides; in the study of Rfidah et al.²⁸ poisonings by household and garden products, and in the study of Oto Geçim et al.¹⁸, poisoning from household products were reported as second in prevalence to drug poisonings.

Poisonings stemming from drugs and cleaning agents each accounted for 42.9% of the poisonings in the 0-1 year age group; however, poisonings by drugs accounted for the majority of poisonings in the 2-3 years age group (44.0%), in the 4-5 years age group (66.7%), and in the 6 years of age group (42.1%). Öntürk et al.⁸ mentioned that the rate of poisoning accidents due to drugs was higher than rates due to other means in children ages 3 months to 4 years and in children aged 5-7 years.

This study reveals that poisoning accidents are concentrated during the spring season at a rate of 46.6%, and in the morning hours (60.2%). Considering Turkey as a whole, it has been reported that poisonings mainly occur in the spring time^{13,14,24,26,29}. The reasons for the poisonings in this period may stem from painting and whitewashing materials and cleaning agents used in cleaning in the open. The 80% rate of poisoning accidents encountered by children under the age of five mainly stems from not properly storing drugs and

chemical materials²⁰. Within the scope of this study, major reasons for the poisoning of the children were found as keeping drugs within the reach of children (49.5%) and storage of cleaning agents in containers other than the original packaging within the reach of children (17.5%). The reasons for the concentration of poisoning accidents among the children under five years of age may primarily stem from the leaving of drugs and other toxic agents within the reach of the children by the families, keeping them in boxes other than the original, and moreover, not properly monitoring the children^{17,31}. In particular, the increasing sale of no-brand cleaning agents in refreshment bottles may account for the current increase in such incidents.

More than half of the mothers (68.9%) claimed to have taken preventive measures at home. Among them, the majority, at 76.1%, claimed to store the drugs out of the reach of the children. This finding parallels results of Erkal's previous study³². Although storage of drugs out of the reach of children at home should have a priority, it is strikingly noteworthy that drug poisoning accidents occur where they are kept within the reach of the children. This finding proves the necessity for educational measures in the families.

It was determined that the mothers were storing drugs, pesticides/insecticides, and cleaning agents within the reach of children in unlocked cupboards at rates of 41.8%, 68.0%, and 62.1%, respectively. According to the results of this study, storage of these agents in improper conditions constitutes a potential threat of poisoning in the young children at home.

Consequently, in order to prevent poisonings in the very vulnerable group of pre-school children, the following measures are suggested to be taken on their behalf: the proper storage of drugs, cleaning agents, insecticides/pesticides etc. in closed cupboards out of reach of children should be encouraged; a secure environment should be established for the children and they should be responsibly supervised at all times; interdisciplinary seminars should be organized on the prevention of poisonings and risk factors for the enlightenment of the community, especially of the parents; and finally, the number of expert poison control

centers should be increased nationwide to determine the range of poisoning agents, and the families should be informed about the uses of poison consultation centers.

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