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The relationship between family socioeconomic condition and childhood injury frequency in selected locations in the Czech Republic

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Summary

Background: Childhood injury rates are monitored worldwide because they markedly affect morbidity and mortality of children. There are numerous works that point out the relationship between family socioeconomic status and injuries, where lower socioeconomic levels are linked to higher numbers of injuries.

Material/Methods: The goal of this work was to evaluate the relationship between family socioeconomic status and childhood injuries in the Czech Republic. The research was carried out between 1/7/2009 and 31/12/2010. A 2-part questionnaire was used to gather information. The first part, "Injury/poisoning of children," included information on the injury itself; the second part, "Family functionality," concerned family socioeconomic situations. We collected a total of 874 questionnaires in the South-Bohemian region and 132 questionnaires from a selected county in the North-Bohemian region. A database identical with the questionnaire assignment was established, comprising all the data accumulated.

Results: The injury rate in families living in poor socioeconomic situations in locality 8 was statistically significantly higher compared to families in good socioeconomic situations. The number of home injuries was 205. Families with incomes that were twice the subsistence level had more child protective measures in their households. There was a statistically significant relationship between the number of child protective measures and injury frequency in families. Children in families having higher incomes (twice that of subsistence level) were more likely to suffer injuries related to organized sports as compared to those in families having lower incomes.

Conclusions: The literature and research data show that preventive programs have the largest effect on reduction in childhood morbidity and mortality with respect to injuries.

key words: **socioeconomic situation of family • children injuries • risk factors**

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Background

Childhood injury rates are monitored worldwide because they markedly affect childhood morbidity and mortality. There are a number of works in the Czech, European and global literature supporting this fact and detailing injury causes, mechanisms and types [1–3]. There are numerous studies that point to a relationship between family socioeconomic status and childhood injuries, where lower socioeconomic conditions result in higher numbers of injuries. These works particularly emphasize the association between poverty and childhood injuries, for example in Africa [1].

Material and Methods

The goal of this work was to evaluate the relationship between family socioeconomic situations and childhood injuries in the Czech Republic.

According to the WHO, injury risk factors are: economic factors (family income), social factors (education of parents, particularly of the mother), family structure factors (a single parent, mother's age, number of children, number of persons living in the household), and housing conditions (dwelling situation, home equipment, population density in surrounding area). In the study presented here, we used factors defined in this way to assess family socioeconomic situations. In the Czech Republic, in response to Law No. 94/63 Sb "On the family" and Law No. 359/99 Sb "On the social-legal protection of children," families are described as being in either a good or poor socioeconomic condition; the assessment is based on the evaluation of the family's socioeconomic situation, which corresponds to the WHO definition [1,4,5].

Data collection was carried out using a questionnaire. The study consisted of 2 stages. The first (pilot) stage was tested with 69 families and the second stage (the research itself) was based on (i) experience from the pilot study, (ii) research of childhood injury rates implemented in 2004, and (iii) on data from the literature [6,7].

The research was carried out between 1/7/2009 and 31/12/2010. A 2-part questionnaire was used to gather information. The first part, "Injury/poisoning of children," included information on the injury itself; the second part, "Family functionality," concerned family socioeconomic conditions. The 2 parts of the questionnaire were tested in a pilot study and adjusted for research purposes based on knowledge acquired. The questionnaires included the informed consent of parents or guardians.

The questionnaire "Injury/poisoning of children" was arranged based on knowledge acquired from project IGA 2004 (IGA MZ ČR NR 8229-3/2004) and adjusted based on information resulting from the pilot study. The questionnaire concerning "Family functionality" – the socioeconomic condition of families – was based on a questionnaire developed by Dunovský [6], which was updated for purposes of the present research by the original author; other information was based on WHO definitions [1].

The sample group included children (up to 18 years of age), who experienced an injury during the research period and whose parents sought medical attention at a medical institution in the South-Bohemian region or in the selected county of the North-Bohemian region. The medical institutions in which the children were treated had previously agreed to cooperate with the research. Injuries included in the research were injuries that required (i) at least 2 treatment sessions or a treatment with subsequent follow-up examination, or (ii) hospitalization. The research examination included children who were treated either by a participating physician or as outpatients in a participating institution regardless of where the child received index treatment. Fatal injuries were not included in the study.

Given the specific nature of the research tool, which is demanding in terms of the professional capacity of the interviewer, data accumulation was provided with assistance of practitioners dealing with children and adolescents within the primary care setting. Twenty pediatricians were randomly chosen (by drawing lots) from a total of 145 pediatricians in the South-Bohemian region. The physicians selected were interviewed and asked to cooperate with the study. Of the 20 randomly chosen physicians, 10 physicians were willing to responsibly participate in the project. In the North-Bohemian region we additionally approached 3 physicians working with children from socially problematic areas. The terms of cooperation included financial remuneration (12 Euros/questionnaire).

The resulting data included information on the number of injuries regardless of familial relationships. Based on data from the Department of Social and Legal Protection of Children (OSPOD) concerning socioeconomic limitations and SLDB 2001 statistics concerning the number of families in the area, the average number of children per family was determined. Based on this, each physician verified the average number of children in families.

We received 874 questionnaires from the South-Bohemian region and 132 questionnaires from the selected county in the North-Bohemian region. The questionnaires represented a total of 659 families.

A total of 874 and 132 injuries were recorded in the South-Bohemian region and in the selected county of the North-Bohemian region, respectively. A total of 12 parents refused to participate.

The sample group from the South-Bohemian region (874 injuries) corresponds to the random choice and is representative. The group from the North-Bohemian region (132 injuries) does not completely adhere to these criteria, in spite of the fact that physicians were randomly selected. (At selected localities of the South-Bohemian region, there are a total of 28,417 families with children. In files of randomly selected pediatricians, there are 8,712 families. The method of the choice of physicians and number of families in their files provide the representative nature of the data for the region concerned).

Parents came to the consultation room seeking child treatment after an injury. In the course of the treatment the parents were asked by the physician to complete the questionnaire. The questionnaire was completed by a physician or nurse in cooperation with the child's parents.

Within the scope of the project was creation of a database identical with the questionnaire, consisting of all the

Table 1. Injury frequency in GSEC and PSEC families (N=659).

Locality examined	Socioeconomic situation in families experiencing injuries		N	Statistical significance
	Poor	Good		
1	1	9	10	ns
2	5	47	52	ns
3	5	8	13	ns
4	22	59	81	ns
5	17	265	282	ns
6	3	42	45	ns
7	6	83	89	ns
8	36	51	87	s

Explanations: ns – not significant at a 5% significance level; s – statistically significant at α=0.05.

accumulated data. The accumulated data were subjected to descriptive statistical processing, and the resulting contingency tables were analyzed using the NCSS program, Statistica v.9a PRISM [8–10]. The following 3 tests were used for contingency tables: chi squared, chi squared with the Yates correction, and the exact Fisher test. In cases where the number of observations was under 5, we employed the p value of the Fisher exact test for a 2-sided hypothesis.

The localities monitored are characterized using data regarding geographical area, number of inhabitants, number of registered families with children dependent on them up to 18 years of age (ie, families assessed to be in poor socioeconomic condition (PSEC) or assessed to be in good socioeconomic condition (GSEC)), and percentage of ethnic minorities in the locality.

- Locality 1 had an area of 1,615 km^2 with 6,954 inhabitants. In the city there were 1,112 registered families with dependent children. The ethnic minority population at social risk was not significant. Locality 2 had an area of 1,326 km^2 and a population of 36,680. In the city there were 5,455 registered families with dependent children. The number of ethnic minority people at social risk was not significant.
- Locality 3 had an area of 1,375 km^2 with 11,802 city inhabitants. In the city there were 1,850 registered families with dependent children. The ethnic minority population at social risk was not significant.
- Locality 4 had an area of 19.99 km^2 with 7,262 city inhabitants. In the city there were 1,038 registered families with dependent children. The ethnic minority population at social risk was not significant.
- Locality 5 had an area of 90.83 km^2 with 8,836 inhabitants. In the city there were 1,278 registered families with dependent children. The ethnic minority population at social risk was not significant.
- Locality 6 had an area of 1,944 km^2 with 22,931 city inhabitants. In the city there were 3,408 registered families with dependent children. The ethnic minority population at social risk was not significant.
- Locality 7 had an area of 1,638 km^2 and includes the second largest county in the South-Bohemian region. The city population was 95,548 and there were 14,276 registered families with dependent children. The ethnic minority population at social risk was not significant.
- Locality 8 had an area of 40.70 km^2 with 27,397 inhabitants. In the city there were 3,700 registered families with dependent children. The ethnic minority population at social risk was significant. This particular area has a history characterized by social unrest that is linked to size of the minority population.

Results

In locality 8 the injury rate in families in poor socioeconomic condition (PSEC) was higher than in families in a good socioeconomic condition (GSEC). The chi-square criterion for the chi-square test with the Yates correction was of 274.17, which corresponds to a p<0.00005 (Table 1).

Two hundred and five household injuries were examined. Families with an income that was twice subsistence level had statistically significantly larger numbers of child protective measures (CPMs) in their household. The 2-sided alternative was employed (p=0.0300) with the Fisher exact test (Table 2).

Table 3 shows that there was a statistically significant relationship between the numbers of CPMs in families and injury frequencies. GSEC families can be divided into 2 groups: families in the first group used CPMs and those in the second group did not use CPMs. In the second group of families there was a statistically higher injury frequency (chi-square test; p=0.000986) (Table 3).

A total of 127 injuries were recorded; 87 of them occurred during organized sports activities. In this group there was a statistically significant relationship to family income. Children in families having higher incomes (twice the family subsistence level) experienced sports injuries more frequently compared to children in families with lower incomes (p=0.00157) (Table 4).

There were differences between median ages of girls in PSEC families and GSEC families. For families in good socioeconomic condition, girls aged 9 experienced injuries

Table 2. Use of child protective measures in households according to family income (N=205).

	Child protective measures		
	Yes	**No**	**Line-Totals**
Frequencies, twice as high income	44	77	121
Percent of total	21.463%	37.561%	59.024%
Frequencies, higher income	18	66	84
Percent of total	8.780%	32.195%	40.976%
Column totals	62	143	205
Percent of total	30.244%	69.756%	
Chi-square (df=1)	V.24	P=0.0221	
Yates corrected Chi-square	IV.56	P=0.0328	
Fisher exact p, one-tailed		P=0.0156	
Two-tailed		P=0.0300	

Table 3. Presence of child protective measures based on family type (N=312).

Family socioeconomic situation	**Child protective measures**		
	Yes	**No**	**Not determined**
Good	59	122	112
Poor	9	10	0
Total of	**68**	**132**	**112**

Table 4. Relationship between family income and occurrence of injuries in organized sports (N=87).

	Lower +	**Higher ++**	**Twice as high +++**	**Total of**
Organized sport	2	39	46	**87**
Non-organized sport	7	52	68	**127**

+ income < family subsistence level (FSL); ++ income > than family subsistence level but < twice FSL; +++ income ≥ twice family subsistence level.

Chi squared, statistical significance	12.92, 2
p value	p=000157
Number of lines	2
Number of columns – income	3

most frequently, and in poor socioeconomic condition, girls aged 12 experienced injuries most frequently (Table 5). In boys, there was no difference in this respect. The gender effect was not significant in this area.

There was a statistically significant relationship between the nature of the injury and family type. The injury type in GSEC families was different from PSEC families, as demonstrated using the chi-square test ($p<0.00001$) (Table 6). These results come from descriptive findings summarized in Table 6, where particular variables were tested and a statistically significant relationship was found between particular types of injuries. In testing all 7 variable combinations, a statistically significantly higher frequency of poisoning in

Table 5. Median age of injured girls based on family type (N=346).

Variable – girl age	Count	Median	95% LCL of Median	95% UCL of Median
Family in good socioeconomic condition	302	9	7	10
Families in poor socioeconomic condition	44	12	9	14

Table 6. Injury nature depending on family type (N=874).

Injury type	Family socioeconomic condition			
	Poor		Good	
	N	%	N	%
Household	30	34	312	40.0
Transport	6	7	52	6.0
Sport	8	9	119	15.0
Free time	23	26	170	22.0
School	16	18	123	16.0
Occupational	1	1	2	0.2
Poisoning	5	5	7	0.8
Total of	**89**	**100**	**785**	**100.0**

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PSEC families was found. The significance levels ranged from p=0.0001 to p=0.0067.

There was a statistically significant relationship between family type and injury mechanism. In GSEC families, the injury mechanism was different from PSEC families (chi-square test; p=0.022587) (Table 7A). These results come from descriptive findings summarized in Table 7a, where particular variables concerning the injury mechanism were tested and a statistically significant relationship was found. Results of statistical testing demonstrated the following combinations of variables to be statistically significant (Table 7B).

In Table 8, there was a statistically significant relationship between family type and frequency of repeat injuries. Families in PSEC had fewer repeat injuries.

The statistical evaluation demonstrated no relationship between the rate of injuries and time of year when the injury occurred. For 2009, p=1.00 and for 2010, p=0.539 (for the 2-sided alternative hypothesis). Thus, the zero hypothesis (no difference between the observed and expected rate of injuries in particular months) cannot be rejected and it is possible to state that the injury frequency was independent of time of year.

Discussion

The questionnaire chosen was compiled based on a secondary analyses of similar research projects implemented in Europe and on a questionnaire that was used and authorized by appropriate administrative bodies in the Czech Republic, and is also being used for other research and information gathering projects. Given the fact that a 5 years had elapsed since the first use of the questionnaire (IGA 2004), it was re-verified in a pilot study. Works by Dunovský date back to the late 1980's, thus it was necessary to obtain authorization directly from the author for the purposes of this research [6]. The scope of this literature source conformed with the WHO definition concerning the socioeconomic situation of families [1]. In its first part, "Injury/poisoning of children", the questionnaire contained 9 sections with 55 questions and the second part, "Family functionality", contained 9 sections with 11 questions (see Web sites).

Physicians were selected at random by drawing lots. The pool of physicians was interviewed and an agreement to cooperate was reached with selected individuals. The reliability of data provided by these physicians was supported by personal negotiations and financial remuneration.

The project was based on quantitative research; its subject was childhood injuries in children up to 18 years of age.

The results of the study were statistically processed using descriptive statistics and non-parametric tests [8–10]. The resulting contingency tables were analyzed using the NCSS program, Statistica v.9a PRISM. Three tests for the contingency tables were used: chi-square, chi-square with Yates correction, and the Fisher exact test. In cases in which the number of observations was below 5, it was necessary to use a p value for the Fisher 2-sided alternative hypothesis test. The results include data on combinations of variables showing statistical significance.

Table 7A. Injury mechanism based on family type (N=874).

Injury mechanism	Family socioeconomic situation			
	Poor		Good	
	N	%	N	%
Fall	29	32.6	335	42.7
Hit obstacle	14	15.7	125	15.9
Collision child-car	3	3.4	7	0.9
Collision child-person	2	2.3	36	4.6
Contact with animal	0	0.0	11	1.4
Knocked down	7	7.9	26	3.3
Slips and falls	17	19	127	16.2
Scalding	2	2.3	21	2.7
Burning	1	1.0	25	3.2
Etching (chemicals)	1	1.0	0	0.0
Injury by electrical current	0	0.0	1	0.3
Injury by sharp object	8	8.9	54	6.9
Extraneous object in body cavity	0	0.0	6	0.8
Poisoning	5	5.6	7	0.9
Other mechanism	0	0.0	4	0.5
Total of	**89**	**100.0**	**785**	**100.0**

Hit *vs.* knocked down: hit – the child hit an obstacle, knocked down – the child was knocked down.

Table 7B. Injury mechanism based on family type – statistical evaluation.

Injury mechanism	Test	Test value	Family socioeconomic situation
Falling – collision with car	Fisher exact	*p=0.0452*	Poor
Falling – knocked down	Squared chi	*p=0.0112*	Poor
Falling – poisoning	Fisher exact	*p=0.0023*	Poor
Hit – poisoning	Fisher exact	*p=0.0084*	Poor
Collision with car – with person	Fisher exact	*p=0.0541*	Poor
Collision with man – poisoning	Fisher exact	*p=0.0059*	Poor
Animal – poisoning	Fisher exact	*p=0.0373*	Poor
Slipping – poisoning	Fisher exact	*p=0.0144*	Poor
Scalding – poisoning	Fisher exact	*p=0.0331*	Poor
Burning – poisoning	Fisher exact	*p=0.0078*	Poor
Sharp object – poisoning	Fisher exact	*p=0.0304*	Poor

About 350 different variable combinations were evaluated and statistically tested. The Results section contains data with statistical significance only.

In the South-Bohemian region of the Czech Republic, socioeconomic conditions for families are not as poor as in developing countries, from which there is abundant data regarding childhood injuries in PSEC families.

In locality 8, the injury rate was statistically significantly higher in PSEC families compared to GSEC families, which partially corresponds to European research results (chi-square

Table 8. Family type and children with frequent injuries.

	Families in poor socioeconomic condition	Families in good socioeconomic condition	Line – total of
Number, frequent injuries: yes	7	36	43
Percent proportion	0.812%	4.176%	4.988%
Number, frequent injuries: no	78	741	819
Percent proportion	9.049%	85.963%	95.012%
Column – total of	85	777	862
Percent proportion	9.861%	90.139%	
Chi squared (ss=1)	2,10	P=0.1475	
Yates corrected chi squared	I.41	P=0.2357	
McNemara chi squared	718.30	P=0.0000	
Chi squared	14.75	P=0.0001	

test; p<0.00005) (Table 1). In general, locality 8 is an area characterized by "social unrest."

Table 2 shows that families having higher incomes have more child protective measures in their homes. Table 3, however, indicates that within GSEC families, the injury frequency is statistically significantly higher in those families without PCMs. Families in GSEC can be thus divided into 2 groups as follows: the first group is families using PCMs in their home, and the second group is families without PCMs in their home. In the second group of families, there was a statistically significantly higher frequency rate (chi-square test; p=0.000986). Due to the low number of PCMs in families in a poor socioeconomic situation, it was impossible to demonstrate this statistically. The table shows that there was a statistically significant relationship between the number of PCMs in families and the injury rate.

Table 4 demonstrates that there is a relationship between higher family incomes and injuries experienced during organized sports activities. Children in families having higher incomes (twice subsistence level) experience more injuries during organized sports activities compared to children in families with low incomes (p=0.00157). The cause of the higher injury rate in children of parents having higher incomes can possibly be explained by the fact that these children can afford more sports activities due to the family's better financial situation, or try new sports activities. In contrast to this, children in families with lower incomes are rather limited, since the family, due to restricted financial means, spends less money on youth sports activities and engage in other leisure activities or non-organized sports.

Table 5 presents differences between medians ages of girls in PSEC and GSEC families. In GSEC families, girls aged 9 years were most frequently injured, while in PSEC families, girls aged 12 years were most often injured. In boys, the median age did not differ between families types. There was no statistical significance with regard to gender. A relationship can possibly also be seen between financial means and sports activities for girls. In terms of family income, girls in GSEC families started sports and leisure activities at a younger age. In contrast to this, girls in PSEC families started sports activates at an older age. The beginning of puberty is considered as an injury risk factor; we found that girls spent more time in an outdoor environment in groups of friends, and first experiments with alcohol use can also play a certain role.

There was a statistically significant difference between the type of injury and family type. The types of injuries in GSEC families were different from those in PSEC families (chi-square test; p<0.00001) (Table 6). A comparison of injuries in families in GSEC and PSEC showed a statistically significant difference. These results are from descriptive finding summarized in Table 6, where a statistically significant relationship was established between particular injuries. In testing all 7 variable combinations, there was a statistically significantly higher frequency of poisoning in PSEC families. The statistical significance levels ranged between p=0.0001 and p=0.0067.

There was a statistically significant relationship between family type and injury mechanism. Injury mechanisms in GSEC families were different from PSEC families (chi-square; p=0.022587) (Table 7A). There was a statistically significant difference between injury mechanisms in GSEC and PSEC families. These results come from descriptive findings summarized in Table 7A, where particular variables concerning injury mechanisms were tested and a statistically significant relationship was established. Results of statistical testing demonstrate a statistical significance among the combinations of variables as shown in Table 7B.

There was a statistically significant relationship between family type and children with frequent injuries; PSEC families had a lower frequency of repeat injuries (p=0.0001) (Table 8). The cause of this can possibly be the above-mentioned sporadically available or absent CPMs, certain failures regarding child care (eg, reduced or absent supervision by adults), unsuitable (or unsafe) housing conditions, etc. Combination of these factors can enhance the risk of repeated injuries in children.

There are possible effects resulting from the presence or absence of CPMs, home equipment, housing conditions, child care and parental involvement, parental supervision of children, etc.

No relationship was statistically demonstrated between the injury rate and time of year (month or season). For 2009, p=1.00 and for 2010, p=0.539 (for the 2-sided alternative hypothesis). Thus, the zero hypothesis (that there was no difference between the observed and expected injury rates in particular months) cannot be rejected and it is possible to state that injury rate was independent of when the injury occurred. In spite of this, it is possible to say that injuries were more frequent in the following months: July (122 injuries), October (116) and September (103), and less frequent in February (37) and December (41). However, this could have been distorted by the timing of the start and conclusion of data collection.

We wanted to know if there was an association between the mother's age and childhood injury rates. In general, children of younger mothers (under 18 years of age) and rather older mothers (above 35 years of age) were at higher risk. However, our data showed that childhood injuries were most common in mothers between 20–35 years. Additionally, mothers in this age range were most numerous in the group studied and also correspond to the average age of childbirth for women in the Czech Republic.

We also wanted to know if there was a specific injury type associated with children experiencing frequent injuries. The most frequent types of injuries in children were contusion (12 injuries), open wound (10), and distortion/sprain (8).

Hutton emphasized an association between the environment in which a child lives and the occurrence of injuries [11]. Faelker presented similar opinions and pointed out relationships between poverty and injuries [12]. Sridharan specified these families with the term "vulnerable family" and identified risk factors associated with low family incomes [13]. Kendrick studied the relationship between families and the environment in which the child lives; interestingly, he considered young mothers to be a risk factor. He also demonstrated that the ethnicity, family income, etc. are also risk factors [14,15]. Alexandrescu mentioned a close relationship between the rate of injuries and a family's socioeconomic situation [16], but Poulos found no relationship between a family's socioeconomic condition and combined injury mechanisms [17]. Ramsay examined families with preschool children and searched for risk factors linked to home injuries; risk factors included lower levels of parental education, unmarried parents and lack of CPMs. He particularly focused on the role of prevention in families from lower social classes [18]. Morrongiello mentioned in the conclusion of his study that children of parents who remained close (proximity) to their children had a lower risk of injury [19]. McKenzie correlated sociodemographic factors in families having children aged 2–3 years; an increased risk was found in children where the father was not part of the family unit. It is of interest that the injury frequency was lower in children in which child care was provided by grandparents [20]. Laursen considered relationships between sociodemographic factors and home injuries; risk factors include lower levels of education, lower income families and lack of CPMs [21]. Villalba-Cota, a Mexican author, considers maternal education, child gender, alcoholism and unwanted children as risk factors [22]. Rogmans mentioned higher risks of drowning, fractures and burns in children from lower social classes [23].

Among Czech authors, Benešová and Grivna have dealt with problems of injuries. The latter author defined poor housing conditions and limited access to CPMs as risk factors. Grivna developed a strategy for injury prevention in the Czech Republic based on the WHO concept [24,25]. Benešová emphasized the need to strengthen general injury prevention, particularly promotion of CPMs and prevention focused on children in higher risk groups [26]. Janoušek monitored the socioeconomic situation of families in relationship to childhood traffic injuries. Associations between education and injury frequency were of interest. The author pointed out that this research was not implemented in the Czech Republic [27]. Čapková found water-related accidents were associated with lack of alertness (due to youthfulness) and insufficient or absent adult supervision [28]. In his work concerning risk factors relative to injury frequency, Tošovský also mentioned the effects of poor socioeconomic conditions and the cause or source of injuries [29].

The studies mentioned above suggest that maternal age is a risk factor, but this was not supported by our research. However, we did find that lower levels of maternal education and lack of CPMs were associated with higher risks. The evaluation of the family condition is very subjective.

Conclusions

In the South-Bohemian region of the Czech Republic, we demonstrated that there were no differences between injury rates in families in good socioeconomic condition and those in poor socioeconomic condition. However, the presence of these differences was demonstrated in a specific region of the Czech Republic that is characterized by 'social unrest.' We also demonstrated a relationship between the use of CPMs and injury frequency. Within the framework of an age evaluation, we found differences in terms of the age of girls who sustained injuries in PSEC families. We demonstrated a higher frequency of injuries suffered in the course of organized sports activities in GSEC families. The mechanism of injury was always more significant in combinations with child poisoning. The type of the injuries was also statistically significant in combinations of poisonings with other variables. We found a significant relationship between family type and children who experienced frequent injuries. We were not able to demonstrate any relationship between maternal level of education or age and the frequency of childhood injuries.

The data from the literature and research results show that preventive programs can be very important in reducing the mortality and morbidity of childhood injuries.

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IRB approval

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