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Socioeconomic characteristic of burned children families

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Abstract

Objective. The aim of the study was to determine the relationship between the socioeconomic factors and chosen parameters of burns in children.

Materials and method. An anonymous survey was conducted among caregivers of 200 children hospitalized due to burns in 5 Polish hospitals. The socioeconomic factors and location of the burn, surface of the burn, depth of the injury, type of treatment, and length of hospitalization were analyzed. Statistical analysis was performed using Statistica v.12.

Results. Single parenthood was related with longer hospitalisation of the child, higher degree of burn wound, and more frequent operative treatment ($p<0.05$). Children from families with several children (≥3) more often had severe burns than the only children ($p=0.018$). A statistically significant relationship was observed between fathers' age and the surface of burn wound, burn depth, burn severity, type of required treatment, and duration of hospitalization ($p<0.05$). In the group of children with minor burns, the percentage of mothers with secondary education was lower than in mothers with primary education ($p=0.004$) and with higher education ($p=0.006$). In the group with average burns, the proportion of mothers with secondary education was higher than with primary education ($p=0.019$). In the group of children with severe burns, the percentage of fathers with primary education was higher than the percentage of fathers with secondary ($p=0.005$) and higher education ($p=0.018$). The surface of burn was higher in children those fathers had lower education ($p<0.05$). Fathers' unemployment was related to higher surface of burn in children ($p<0.05$).

Conclusions. The relationship between socioeconomic factors and analyzed parameters of burns is important to identify the groups for which preventive actions should be designed.

Key words

children, family, socioeconomic factors, burns

INTRODUCTION

Burn trauma is considered as very devastating and often occurs in childhood. The problem of burns among children is still actual in low-income and high-income countries [1–12]. The problem of burns among children, especially infants and toddlers, is usually related to the behavior of the caregivers [13–14]. The leading type of burns in Poland in this age group are scalds [15–16], and it seems that most of the situations leading to this type of trauma could be avoided. There are many factors that can affect the risk of burns [13, 14, 17]. There are no studies about the relationship between the socioeconomic characteristics of families of Polish children.

OBJECTIVE

The objective of the study was to determine whether a relationship exists between socioeconomic factors and the chosen parameters of burns in children. It seems important to choose adequate prevention methods and identify the groups for which preventive actions should be designed. Moreover, during the first stage of pandemics, an increase was observed in the number of hospitalizations of burned children [18–22].

MATERIALS AND METHOD

An anonymous questionnaire was conducted among the caregivers of 200 children (80 girls, 120 boys) under 18 years of age hospitalized due to burns in 5 Polish hospitals: Department of Paediatric Surgery, Marciniak Hospital in Wrocław (146 patients); Department of Paediatric Surgery, Burns and Paediatric Urology 'Zdroje' in Szczecin (31 patients); Department of Paediatric Surgery, WCM in Opole (16 patients); Department of Plastic Surgery, SCM in Polanica Zdrój (5 patients); and the Clinic of Paediatric Surgery and Paediatric Urology in Wrocław (2 patients). The study was conducted between 5 March 2014 – 5 March 2016.

The survey was in two parts. The first was completed by the parents/caregivers and included questions about the socioeconomic factors (economic situation of the family, family structure). The second was completed by the medical staff and provided information about the chosen characteristics of the burn injuries.

The collected data included location of the injury, surface of burned skin (%TBSA), depth of the burn wound, type of treatment (surgical or preservative), and duration of hospitalization (days). The surface of burned skin (%TBSA)

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was calculated with the use of the Lund-Bowder chart for children under 16 years old, and with the rule of nines for children aged over 16 years. After clinical assessment of the depth of the burn wound (4-degrees scale), the patients were divided into two groups: partial-thickness (I-II) and full-thickness burns (III-IV). The American Burn Association severity classification was used to categorize patients into three groups: minor, moderate, and major burn. The group of minor burns included burns I degree; burns II degree<10% TBSA; burns III degree<5% TBSA. The group of moderate burns included burns II degree – 10–20 % TBSA; burns III degree<10 % TBSA; burns affecting the face, eyes, ears, hands, and feet. The group of major burns included burns II degree>20% TBSA; burns III degree>10% TBSA; burns III degree that involved the face, hands, feet, genitalia, and perineum; electric burns, chemical burns, inhalation injury, and oesophageal burns. In accordance with the classification, the patients with pre-existing medical disorders and patients with concomitant trauma were categorized as major burns [23]. Inclusion criteria were:

- hospitalization because of burn injury;
- agreement of caregivers and patients over 16 years old to participate in the study;
- patient age under 18 years old.

Exclusion criteria:

- non-agreement of caregiver/patient to participate in the study.

The indications for hospitalization in children with burns according to the Polish recommendations are age under 1-year-old; moderate and major burns; circumferential burns of trunk and extremities; burns involving major joints, fingers, toes; burns involving the face, hands, feet, genitalia, perineum; electric burns; chemical burns; inhalation injury, oesophageal burns, and suspicion of non-accidental burn [23].

The study was accepted by the Bioethical Committee of Wrocław Medical University (Opinions Nos. KB – 109/2014, KB – 305/2015, KB – 493/2015, KB – 518/2015, KB – 141/2016). The study was carried out from 5 March 2014 to 5 March 2016.

Statistical analysis of the obtained data was performed using Excel and Statistica v. 12.

RESULTS

Characteristics of families of burned children. The obtained results indicate that most of the burned children lived in families presenting the '2+2' model, consisting of both parents and two children. Mostly, the average age of fathers was higher than that of the mothers (Tab. 1). There was a statistically significant difference between the education level of the mothers and fathers (p=0.0258) and working activity (p < 0.00001).

Table 1. Basic statistics of parents' age and number of children in the families of burned children

	No. of children in the family	Mothers' age	Fathers' age
M ± SD	1.9 ± 1.0	31.4 ± 6.4	34.2 ± 6.7
Me (Q1; Q3)	2 (1; 2)	32 (27; 36)	34 (29; 39)
Min. – Max.	1 – 8	17 – 45	21 – 52

Table 2. Parental education level. Unemployment of parents

Parameter	Mothers		Fathers	
	n	%	n	%
Education level				
Elementary	14	7.0%	15	7.5%
Secondary	88	44.0%	110	55.0%
Higher	77	38.5%	52	26.0%
No data	21	10.5%	23	11.5%
Is a parent working?				
Yes	81	40.5%	11	5.5%
No	100	50.0%	164	82.0%
No data	19	9.5%	25	12.5%

Single parenthood. In the study group, a single parenthood was confirmed in 22 children. The group of 'single parenthood' included children raised by single mothers or single fathers (there were no single fathers). The group under the heading 'No' included children who live in a full family or with one of their parents and grandfather or grandmother. Children living in an educational centre or with a person other than a parent were excluded from the analysis.

No statistically significant relationship ($p>0.05$) was observed between the surface of the burn and single parenting. Single parenthood was related with longer hospitalisation of the child, higher degree of burn wound, and more frequent operative treatment ($p<0.05$).

Table 3. Single parenthood and the surface of burn (%TBSA), length of hospitalization (days) of burned children

	Single parenthood		
	Yes N = 12	No N = 138	t Student's test p
Surface of burn (%TBSA)			
M ± SD	8.4 ± 5.1	8,6 ± 8,5	
Me (Q1; Q3)	9.5 (4.5; 10.5)	6 (4; 11)	0.957
Min. – Max.	1 – 17	1 – 70	
Length of hospitalization (days)			
M ± SD	13.1 ± 9.8	7.5 ± 5.1	
Me (Q1; Q3)	13.5 (8; 14)	6 (4; 10)	0.003
Min. – Max.	3 – 38	1 – 31	

Table 4. Lone parenthood and the depth of burn wound, severity of burn, type of treatment required by burned children

	Single parenthood				
	Yes (N=12)		No. (N=138)		Chi-squared test
Parameter	n	%	n	%	p
Depth of burn (o)					
I–II	4	33.3	93	67.4	0.017
III–IV	8	66.7	45	32.6	
Severity of burn					
Minor (2 children), Moderate	5	31.7	99	52.3	0.027
Major	7	58.3	38	27.7	
Treatment					
Conservative	5	41.7	105	75.0	0.032
Operative	7	58.3	35	25.0	

Number of children in the family and analyzed parameters of burns. Number of children in the family differed from 1 – 8 (M ± SD: 1.9±1.0; Me=2; Q1 =1; Q3 =2). No statistically significant relationship was observed between children in the family and the surface of burn wound (p>0.05), burn depth (p>0.05), duration of hospitalization (p>0.05), and type of treatment required (p>0.05). Children from families with several children more often had severe burns than the only children (p=0.018).

Table 5. Basic statistics of number of children in the family and analyzed parameters of burns

	No. of children in the family						
	1		2		≥ 3		Chi-squared test
Parameter	n	%	n	%	n	%	p
Depth of burn (o)							
I–II	45	65.2	40	68.9	15	55.6	0.482
III–IV	24	34.8	18	31.1	12	44.4	
Severity of burn							
Minor	21	30.9	9	15.5	7	25.9	
Moderate	27	39.7	36	62.1	7	25.9	**0.018**
Major	20	29.4	13	22.4	13	48.2	
Treatment							
Conservative	51	72.9	46	78	16	59.3	0.196
Operative	19	27.1	13	22	11	40.7	

Table 6. Basic statistics of number of children in the family and analyzed parameters of burns

	No. of children in the family			ANOVA
Parameter	1	2	≥ 3	p
Surface of burn (%TBSA)				
M ± SD	7.8 ± 6.3	8.8 ± 7.5	8.9 ±12.5	
Me (Q1; Q3)	6 (3; 11)	7,5 (4; 11)	6 (4; 15)	0.7255
Min. – Max.	1 – 25	1 – 51	1 – 70	
Length of hospitalization (days)				
M ± SD	7.4 ± 6.0	8.23 ± 6.9	10.03±7.6	
Me (Q1; Q3)	5 (4; 10)	7 (4; 9)	8 (4; 10)	0.24378
Min. – Max.	1- 38	1- 16	1- 31	

Age of parents. No statistically significant relationship was observed between mothers' age and surface of the burn wound (p>0.05), burn depth (p>0.05), burn severity (p>0.05), and type of treatment required (p>0.05). The duration of hospitalization was longer when the age of mother was younger (p>0.05). A statistically significant relationship was observed between fathers' age and surface of the burn wound, burn depth, burn severity, type of treatment required, and duration of hospitalization (p < 0.05).

Education of parents. No statistically significant relationship was observed between parental education and burn depth, type of treatment required, and duration of hospitalization (p < 0.05). In the group of children with minor burns, the percentage of mothers with secondary education was lower than in mothers with primary education (12.3% vs. 46.2%; p=0.004), and with higher education (12.3% vs. 31.8%; p=0.006). In the group with average burns, the proportion of mothers with secondary education was greater than those with primary education (58.9% vs. 23.1%; p=0.019). Both children of mothers with higher and secondary education most often suffered from moderate severity burns. Surprisingly, children of mothers with primary education most often suffered from minor burns. The positive influence of the mother's higher education on the severity of the child's injury was not confirmed. However, the subject requires in-depth research due to the fact that the group of burned children whose mothers had primary education was relatively small (13 patients). In the group of children with severe burns, the percentage of fathers with primary education was significantly higher than the percentage of fathers with secondary education (64.3% vs. 26.4%; p=0.005) and higher (64.3% vs. 28.3%; p=0.018).

These results seem to confirm the positive influence of the father's education on the severity of burn in children. However, similarly to the analysis of the mother's education, the small number of people with primary education should be taken into account. Moreover, the surface of burn was higher in children whose fathers had lower education (p < 0.05).

Table 7. Basic statistics of parental age and analyzed parameters of burns

Parameter	Mothers		Fathers	
	M ± SD	p	M ± SD	p
Depth of burn (o)				
I–II	30.76±6.03	0.061	32.55±7.32	0.004
III–IV	32.4±6.89		35.83±7.61	
Severity of the burn				
Minor, Moderate	31,06±6,22	0.193	33.05±7.45	0.044
Major	32.0±6.72		35.25±7.67	
Treatment				
Conservative	30.88±6.19	0.071	32.78±7.29	0.006
Operative	32.51±6.73		36.06±7.78	
Surface of burn (%TBSA)				
<10	31.15±6.20	0.256	34.51 ±7.09	0.020
>10	31.30±6.55		31.68 ±8.50	
Length of hospitalization (days)				
<7	30.41±5.99	**0.019**	32.59 ±6.64	0.015
>7	23.32±6.66		35.54 ±8.49	

Unemployment and parameters of burns. Analysis of parental working activity and analyzed parameters of burns revealed that the fathers' unemployment was related to a higher surface of burn in children (p < 0.05).

Economic situation of the family. This was assessed based on the subjective assessment of the caregivers. The question of the economic situation of the family could be answered with one of five answers. Due to the small size of the group of people who answered 'bad' or 'very bad', these groups were analyzed together. According to the obtained data on the economic situation of the family, three groups were distinguished. 113 caregivers described their economic situation as 'good' and 'very good', 39 as 'average', and 3 as 'bad' or 'very bad'.

No statistically significant relationship was observed between the economic situation of the family and the surface

Table 8. Basic statistics of parental education level and analyzed parameters of burns

	Mother's education							Father's education						
	1		2		3		χ^2 test	1		2		3		χ^2 test
Parameter	n	%	n	%	n	%	p	n	%	n	%	n	%	p
Depth of burn (°)														
I–II	9	69.2	47	64.4	42	63.6	0.928	5	35.7	61	67.0	31	67.4	0.064
III–IV	4	30.8	26	35.6	24	36.4		9	64.3	30	33.0	15	32.6	
Severity														
Minor	6	46.2	9	12.3	21	31.8		1	7,1	20	22,0	15	32.6	
Moderate	3	23.1	43	58.9	24	36.4	**0.007**	4	28.6	47	51.6	18	39.1	**0.029**
Major	4	30.8	21	28.8	21	31.8		9	64.3	24	26.4	13	28.3	
Treatment														
Conservative	8	61.5	54	72.0	49	74.2	0.647	7	50.0	69	74.2	34	73.9	0.161
Operative	5	38.5	21	28.0	17	25.8		7	50.0	24	25.8	12	26.1	

Table 9. Basic statistics of parental education level and analyzed parameters of burns

	Mother's education			ANOVA	Father's education			ANOVA
Parameter	1	2	3	p	1	2	3	p
Surface of burn (%TBSA)								
M ± SD	10.5 ± 12.8	9.0 ± 5.4	8.0 ± 9.7		14.9 ± 12.0	9.0 ± 8.6	6.0 ± 4.3	
Me (Q1; Q3)	6 (4; 10)	8 (5; 11)	5 (3; 10)	0.530	15 (6; 18)	7 (4; 11)	5 (3; 9)	**0.002**
Min. – Max.	2 – 51	1 – 25	1 – 70		2 – 51	1 – 70	1 – 17	
Length of hospitalization (days)								
M ± SD	8.3 ± 6.1	8.7 ± 6.4	7.2 ± 5.0		10.7 ± 4.9	7.5 ± 4.4	8.5 ± 7.8	
Me (Q1; Q3)	6 (4; 16)	7 (5; 13)	6 (3.5; 10)	0.400	12 (8; 15)	6 (4; 10)	7 (3; 11)	0.252
Min. – Max.	3 – 17	1 – 38	1 – 21		3 – 17	1 – 19	1- 38	

Table 10. Basic statistics of parental unemployment and analyzed parameters of burns

	Mother's unemployment					Father's unemployment				
	yes		no		χ^2 test	yes		no		χ^2 test
Parameter	**n**	**%**	**n**	**%**	***p***	**n**	**%**	**n**	**%**	***p***
Depth (°)										
I–II	48	70.6	52	60.5	0.191	5	50.0	92	65.7	0.315
III–IV	20	29.4	34	39.5		5	50.0	48	34.3	
Severity										
Minor	16	23.5%	21	24.7%		2	20.0%	34	24.5%	
Moderate	33	48.5%	37	43.5%	0.814	3	30.0%	65	46.8%	0.360
Major	19	27.9%	27	31.8%		5	50.0%	40	28.8%	
Treatment										
Conservative	45	75.0%	60	73.2%	0.959	5	50.0%	105	73.9%	0.204
Operative	15	25.0%	22	26.8%		5	50.0%	37	26.1%	

Table 11. Basic statistics of parental unemployment and analyzed parameters of burns

	Mother's unemployment			Father's unemployment		
Parameter	yes	no	p	yes	no	p
Surface of burn (%TBSA)						
M ± SD	9.3 ± 7.7	8.1 ± 8.6		15.7 ± 14.0	8.1 ± 7.6	
Me (Q1; Q3)	7.5 (4; 12)	6 (3; 10)	0.350	11 (8; 17)	6 (4; 10)	0.005
Min. – Max.	1 – 51	1 – 70		1 – 51	1 – 70	
Length of hospitalization (days)						
M ± SD	8.0 ± 6.6	7.9 ± 5.1		9.2 ± 4.4	8.0 ± 5.9	
Me (Q1; Q3)	6 (4; 9)	6 (3; 13)	0.954	9 (6; 12)	6 (4; 12)	0.647
Min. – Max.	1 – 38	1 – 21		4 – 15	– 38	

of burn wound (ANOVA; p=0.966; p>0.05), and duration of hospitalization (ANOVA; p=0.421; p>0.05). Similarly, no statistically significant relationship was observed between burn depth (p=0.197; p>0.05), burn severity (p=0.614, p>0.05), type of treatment required (p>0.05), and the economic situation of the family ('good', 'very good' vs. 'average'; three children with 'bad' and 'very bad' economic situation were excluded from the analysis). Interestingly, children from families with an average economic situation required surgical treatment slightly more often than children from families with 'very good' and 'good' economic situations (31.7% vs. 26.5%; $p > 0.05$).

DISCUSSION

There are many factors that can affect the risk of burns [13–14]. Many injuries are the consequences of the lack of parental supervision or insufficient knowledge about the situations that can lead to burns [11, 24–28].

In the literature, there are no data on whether there exists a relationship between socioeconomic factors and burns in Polish children. The current study investigating a possible association between a family structure, parental education, economic situation of the family conditions, and chosen characteristics of burn injury in the Polish population, is therefore innovative. The advantage of the study is the fact that it was conducted in several hospitals in different regions of Poland.

Nevertheless, the encumbrance of the analysis was the likelihood of the caregivers to provide truthful answers, avoiding answers to particular questions, and their ability to objectively assess their own situation. For example, when respondents describing the economic situation of the family as 'good' were asked about the income per family member, the responses varied. It must be underlined that the participants in the study were recruited from surgical departments, therefore patients with minor burns without indications of hospital treatment were not included in the analysis. It must be noted that it was probable that youths living some distance from the children's surgical wards were treated in paediatric departments, insofar as they did not require surgical treatment.

In the literature there are many reports about the relationship of the family structure and the occurrence of injuries in children. The obtained results indicate that most of burned children lived in the families that represented the '2+2' model, consisting of both parents and two children. Single parenthood was related with longer hospitalisation of the child, higher degree of burn wound, and more frequent operative treatment ($p < 0.05$). This fact could be related to the limited number of caregivers in single parent families. Longer hospitalization could be the result of the problem with providing adequate care to the burned child by a single parent. Similarly, a Danish study showed an increased risk of burns and other injuries in children raised by single parents, compared to children from so-called 'full families' [8]. However, the authors point out that analysis of all socio-demographic factors showed that parenting had no association with injury risk [29]. Alnababtah et al. confirms a relationship between single parent families and burns [15], and a study conducted in Finland confirms that the marital status of parents affected the risk of burns [30]. In the analysis by Karan et al., only 66% of fathers lived with their burned offspring [31]. The association of fatal burns in children resulting from fires with single parenthood has been confirmed in the study undertaken in the United States [32]. The authors associate this fact with fewer adults in the household who could save a child, more frequently leaving the child unattended, and a worse financial situation [32].

Mashreky et al. discovered that the risk of burns was significantly more elevated in children from single-generational families compared to children of extended families [33]. The authors suggested that the presence of grandparents caring for a child has a protective effect. In current study, only 6.5% of burned children lived with their grandmother and/or grandfather, and one or both parents. This seems insufficient to confirm the 'protective properties' of multi-generation families.

In this study, children from families with several children (≥3) more often had severe burns than the only children (p=0.018). Other researchers have also investigated the number of siblings of burned children. Laitakari et al. found that the eldest child had a higher risk of burns than the younger siblings [30]. In a study conducted in France, 48.8% of burned children had two or more siblings [34]. Mercier and Blond found that the proportion of large families (more than three children) was higher in the burn group than in the French population – 44.1% vs. 21% [35]. Similarly, a study conducted in the UK showed that families with at least three children have a higher risk of burns [36]. Aghaei et al. found that more than five members in the household was a risk factor of paediatric burns [37]. Opposite results were obtained by Laursen and Nielsein in Denmark where the fact that the child was one of three or more children in the family did not increase the risk of burns [29]. It can be assumed that in large families, due to the large number of household duties, it is more difficult for the caregivers' attention to be equally divided between all children. It can be also the result of a situation where the caregivers need to leave younger children in the care of older siblings. In this way, children (even unconsciously) are able to lead to a situation of burns to younger siblings, e.g. by leaving a cup with a hot drink on the edge of a table.

In the literature there are many reports about the relationship of the age of parents with the injuries in the child. Laitakari et al. found an increased risk of burns in children of young mothers under the age of 25 [30]. Laursen and Nielsen confirmed that a higher risk of burns occurred in children whose mothers were under 25 years of age at the time of delivery [29]. Mercier and Blonde, however, state that the age of the mother was not related to the frequency of burns [35]. According to Joseph et al., the literature discrepancies result from the fact that the young age of the mother is associated with an overall increase in the risk of injuries to the child, and from the fact that some of the studies only concern fatal cases of burns [38]. In the current study, the duration of hospitalization was longer when the age of mother was younger (p>0.05). Moreover, a statistically significant relationship was observed between the age of the fathers and the surface of the burn wound, burn depth, burn severity, type of treatment required, and duration of hospitalization (p<0.05).

Education is considered as the most effective method for the prevention of children's burns [39, 40]. The education of parents is commonly described in the literature as a factor reducing the risk of child injuries. Khandarmaa et al. observed

that urban children whose mothers had a college degree had a 2-fold lower risk of burns [41]. In a study conducted in Cairo, Egypt, as many as 67.7% of burned children had an illiterate mother [42]. Forjuoh et al. also described the association of maternal education with a reduced risk of burns in the child [43], while Laursen and Nielsen showed an increased risk of burns in the offspring of parents with primary education [29]. According to the authors, higher education and the experience that parents acquire with age are factors that protect a child from injury [29]; Shai and Lupinacci also noted a link between fatal burns from fires in minors whose parents had a lower education (less than nine years of study) [32]. Delgado et al. found that the education of both the mother and father is a factor in reducing the risk of burns; however, in their study, a smaller role was attributed to the father's education [44]. In the study by Wang et al., the majority of parents/guardians had no high school or degree, and many were farmers or migrant workers [45]. In the current study, the positive influence of the mother's higher education on the severity of the child's injury was not confirmed; however, the results have limited value due to the fact that the group of burned children whose mothers had primary education, was relatively small. Those results confirm the positive influence of the father's education on the severity of burn in in children. Moreover, the surface of burn was higher in children whose fathers had lower education ($p<0.05$).

The professional activity of caregivers is also of interest to researchers. The employment by both parents should be associated with an improvement in the financial situation of the family. On the other hand, worse supervision of children is to be expected by the absence of mother and father from home. In addition, the loss of employment is associated with stress and the deterioration of mood, which can make it difficult to take proper care of the offspring. In the current study it was found that more extensive burns were found in children whose fathers did not work ($p<0.05$). The results of the study by Van Niekerk et al. indicate that unemployment, which causes a disturbance in the financial management of the family, is a factor that increases the risk of a child being burned [46]. Colvin et al. investigated relationships between county-level unemployment and paediatric hospitalizations in fourteen states of the USA. They noticed that raised unemployment was associated with heightened paediatric hospitalizations due to burns [47]. The unemployment rate of caregivers was also high in the retrospective review by Dinesh et al. among the patients aged 0 – 18 years, admitted to a burn care unit [48]. The increased risk of burns in the offspring of unemployed parents was also described by Dědovic et al. [49]. Shai and Lupinacci showed a relatioship between parental unemployment and the mortality of children burned by fires [31]. In the study by Mashreky et al. the risk of burns was higher in children whose mothers spent more than eight hours a day away from home, which can be associated with professional activity. However, the differences compared to the children of mothers who spent all their time at home were not statistically significant [33]. In a French study, Mercier and Blond found that 43.8% of mothers of burned children did not work professionally, but took care of the home [35]. However, Gyedu et al. noted that the children of working parents have a significantly increased risk of burns compared to the offspring of the unemployed [50].

In the analyzed material, no relationship was found between the financial situation and the examined parameters of the burn. In a study conducted in Denmark, the risk of burns was almost twice as high in the group with the lowest income compared to the group with the highest income [29]. Padalko et al. also confirms a relationship between risk of burn injury in children and family income [51]. In London, a geographical analysis of socioeconomic factors showed a higher incidence of burns in families with a poor financial standing [36]. Patel et al. noticed that increasing poverty led to an increase in the odds of scald burns [52]. In the study by Borg et al., families of low socioeconomic status were disproportionately affected by sink-bathing scalds. [25]. Kamal also observed a significant relationship between burn injuries and low family income; in his opinion, a better financial situation is probably related with better, safer housing conditions [53]. In the USA, the association of fatal burns of children as a result of fires in low income families has been confirmed [32, 54]. In a study by El-Badawy and Mabrouk, all burned children came from low-income families [42]. Lal et al. found that low socioeconomic increased the frequency of burns in children [55].

In the current study, most of the respondents described their situation as 'good' or 'very good' and a positive correlation was observed between subjective assessment and income per family member. However, income per family member in most cases (31.0%) was between 501–1,000 PLN, which was lower than the average net disposable income per one person in households according to the Central Statistical Office – 1,410.17 PLN in this period [56]. Indirectly, it can be concluded that despite declaring a good financial situation, the children actually came from poorer families. The explanation for the discrepancies between the current results and the results of other studie, may be the fact of analyzing the subjective assessment of the parents and not verifying the data provided by them regarding income per family member.

CONCLUSIONS

Analysis of the socioeconomic characteristics of the families burned children confirm a relationship between the family structure, parental education, and unemployment with analyzed parameters of burns. Further research is necessary to identify the groups for whom preventive actions should be designed, and to select adequate prevention methods.

REFERENCES

1. Tran S, Jacques MA, Holland AJ. Assessment and management of minor burns in children. Aust J Gen Pract. 2019;48(9):590–594. doi:10.31128/AJGP-04-19-4919
2. Norbury WB, Herndon DN. Management of Acute Pediatric Hand Burns. Hand Clin. 2017;33(2):237–242. doi:10.1016/j.hcl.2016.12.002
3. Alnababtah K, Khan S. Socio-demographic factors which significantly relate to the prediction of burns severity in children. Int J Burns Trauma. 2017;7(5):56–63.
4. Pediatric Disaster Branch of Chinese Pediatric Society of Chinese Medical Association; Pediatric Branch of Chinese People's Liberation Army (Zheng C-Z). Expert consensus on the prevention and first-aid management of burns in children. Zhongguo Dang Dai Er Ke Za Zhi. 2021;23(12):1191–1199. doi:10.7499/j.issn.1008-8830.2109026
5. Loos M-LHJ, Almekinders CAM, Heymans MW, et al. Incidence and characteristics of non-accidental burns in children: A systematic review. Burns. 2020; 46(6):1243–1253. https://doi.org/10.1016/j.burns.2020.01.008
6. Mathur A, Mehra L, Diwan V, et al. Unintentional Childhood Injuries in Urban and Rural Ujjain, India: A Community-Based Survey. Children. 2018; 5(2): 23. https://doi.org/10.3390/children5020023

7. Keshavarz M, Javanmardi F, Mohammdi AA. A Decade Epidemiological Study of Pediatric Burns in South West of Iran. World J Plast Surg. 2020;9(1):67–72. doi:10.29252/wjps.9.1.67
8. Trop M, Herzog SA, Pfurtscheller K, et al. The past 25 years of pediatric burn treatment in Graz and important lessons been learned. An overview. Burns. 2015;41(4):714–720. https://doi.org/10.1016/j.burns.2014.10.001
9. Gabbe BJ, Watterson DM, Singer Y, et al. Outpatient presentations to burn centers: Data from the Burns Registry of Australia and New Zealand outpatient pilot project. Burns. 2015; 41(3): 446–453. https://doi.org/10.1016/j.burns.2014.11.013
10. Goltsman D, Li Z, Bruce E, et al. Spatial analysis of pediatric burns shows geographical clustering of burns and 'hotspots' of risk factors in New South Wales, Australia. Burns. 2016;42(4):754–762. https://doi.org/10.1016/j.burns.2016.02.026
11. Dhopte A, Bamal R, Tiwari VK. A prospective analysis of risk factors for pediatric burn mortality at a tertiary burn center in North India. Burns & Trauma, 2017;5:30. https://doi.org/10.1186/s41038-017-0095-7
12. Lee CJ, Mahendraraj K, Houng A, et al. Pediatric burns: a single institution retrospective review of incidence, etiology, and outcomes in 2273 burn patients (1995–2013). J Burn Care Res. 2016;37(6):e579-e585. https://doi.org/10.1097/BCR.0000000000000362
13. Kawalec A. Environmental factors of burns in children – review. Medycyna Środowiskowa – Environmental Medicine. 2015;18(3):40–46.
14. Emond A, Sheahan C, Mytton J, et al. Developmental and behavioural associations of burns and scalds in children: a prospective population-based study. Arch Dis Child. 2017;102(5):428–483. doi:10.1136/archdischild-2016-311644
15. Kawalec A, Pawlas K. Struktura oparzeń wśród dzieci na Dolnym Śląsku (Polska). Probl Hig Epidemiol. 2014;95(2):394–399.
16. Kawalec A, Kawalec A, Pawlas K. Struktura oparzeń wśród dzieci na Dolnym Śląsku (Polska). Część II. Probl Hig Epidemiol. 2014;95(3): 744–747.
17. Lam NN, Hung NT, Duc NM, et al. Epidemiology And Risk Factors For Death Of Pediatric Burns In A Developing Country. An Experience From The National Burn Hospital. Ann Burns Fire Disasters. 2021;34(3):213–217.
18. Kawalec A. The changes in the number of patients admissions due to burns in Paediatric Trauma Centre in Wroclaw (Poland) in March 2020. Burns. 2020;46(7):1713–1714. doi: 10.1016/j.burns.2020.05.007
19. Charvillat O, Plancq M-C, Haraux E, et al. Epidemiological analysis of burn injuries in children during the first COVID-19 lockdown, and a comparison with the previous five yearsAnalyse épidémiologique des brûlures chez les enfants pendant le premier confinement COVID-19 et comparaison avec les cinq années précédentes. Annales de Chirurgie Plastique Esthétique. 2021;66(4):285–290. https://doi.org/10.1016/j.anplas.2021.06.001
20. Sanford EL, Zagory J, Blackwell J-M, et al. Changes in pediatric trauma during COVID-19 stay-at-home epoch at a tertiary pediatric hospital. J Pediatric Surg. 2021;56(5):918–922. https://doi.org/10.1016/j.jpedsurg.2021.01.020
21. Williams FN, Chrisco L, Nizamani R, et al. COVID-19 related admissions to a regional burn center: The impact of shelter-in-place mandate. Burns Open. 2020;4(4):158–159. https://doi.org/10.1016/j.burnso.2020.07.004
22. Sethuraman U, Stankovic C, Singer A, et al. Burn visits to a pediatric burn center during the COVID-19 pandemic and 'Stay at home' period. Burns. 2021;47(2):491–492. doi:10.1016/j.burns.2020.08.004
23. Kuzański W. Oparzenia u dzieci. In: Tkaczyk M, editor. Stany nagłe. Pediatria. 2nd ed. Warszawa: Medical Tribune Polska; 2018. p. 251–267.
24. Collier ZJ, Ramaiah V, Glick JC, et al. A 6-Year Case-Control Study of the Presentation and Clinical Sequelae for Noninflicted, Negligent, and Inflicted Pediatric Burns. J Burn Care Res. 2017;38(1):e101-e124. doi:10.1097/BCR.0000000000000408
25. Borg BA, Durgham M, Shanti CM, et al. Sink bathing burns: A unique opportunity for an injury prevention initiative. Burns. 2020;46(8): 1875–1879. https://doi.org/10.1016/j.burns.2020.05.016
26. Sözen İ, Güldoğan CE, Yastı AÇ. Etiology of childhood burns and parental awareness in Turkey. Ulus Cerrahi Derg. 2015;32(3):168–172. doi:10.5152/UCD.2016.3285
27. Elsous A, Salah M, Ouda M. Childhood burns: an analysis of 124 admissions in the Gaza Strip. Ann Burns Fire Disasters. 2015;28(4):253–258.
28. Ibrahem AM, Rashed KJ, Babakir-Mina M, et al. Mother's characteristics, knowledge and practices about children burn injury in Sulaimani City. Kurdistan J Applied Res. 2017; 2(2), 6–12. https://doi.org/10.24017/science.2017.2.3
29. Laursen B, Nielsen JW. Influence of sociodemographic factors on the risk of unintentional childhood home injuries. Eur J Public Health. 2008;18(4):366–70. doi: 10.1093/eurpub/ckn034
30. Laitakari E, Koljonen V, Rintala R, et al. Incidence and risk factors of burn injuries among infants, Finland 1990–2010. J Pediatr Surg. 2015;50(4):608–12. doi: 10.1016/j.jpedsurg.2014.05.034
31. Karan A, Amado V, Vitorino P, et al. Evaluating the socioeconomic and cultural factors associated with pediatric burn injuries in Maputo, Mozambique. Pediatr Surg Int. 2015; 31(11):1035–40. doi: 10.1007/s00383-015-3761-5
32. Shai D, Lupinacci P. Fire fatalities among children: an analysis across Philadelphia's census tracts. Public Health Rep. 2003;118(2):115–26. doi: 10.1016/S0033-3549(04)50226-1
33. Mashreky SR, Rahman A, Khan TF, et al. Determinants of childhood burns in rural Bangladesh: A nested case-control study. Health Policy. 2010;96(3):226–30. doi: 10.1016/j.healthpol.2010.02.004
34. Mercier C, Blond MH. Epidemiological survey of childhood burn injuries in France. Burns. 1996;22(1):29–34. doi: 10.1016/0305-4179(95)00073-9
35. Mercier C, Blond MH. Enquête épidémiologique française sur la brûlure de l'enfant de 0 à 5 ans. Archives de Pédiatrie. 1995; 2(10): 949–956. doi: 10.1016/0929-693X(96)89890-3
36. Heng JS, Atkins J, Clancy O, et al. Geographical analysis of socioeconomic factors in risk of domestic burn injury in London 2007–2013. Burns. 2015;41(3):437–45. doi: 10.1016/j.burns.2014.12.001
37. Aghaei A, Mehrabi Y, Ramezankhani A, et al. Factors related to pediatric burn in Iran: A case-control study. Int J Pediatrics. 2018;6(6), 7823–7832.
38. Joseph KE, Adams CD, Goldfarb IW, et al. Parental correlates of unintentional burn injuries in infancy and early childhood. Burns. 2002;28:455–463. doi: 10.1016/S0305-4179(02)00035-9
39. Tajiki I, Vizeshfar F, Keshtkaran Z. The effect of training program based on health belief model on burn prevention knowledge in mothers of children aged to 1–3 years: A randomized controlled. Burns. 2021;16:S0305-4179(21)00309-0. doi: 10.1016/j.burns.2021.11.001
40. D'cunha A, Rebekah G, Mathai J, et al. Understanding burn injuries in children—A step toward prevention and prompt first aid. Burns. 2021;24:S0305-4179(21)00190-X. doi: 10.1016/j.burns.2021.07.010
41. Khandarmaa TO, Harun-Or-Rashid M, Sakamoto J. Risk factors of burns among children in Mongolia. Burns. 2012;38(5):751–7. doi: 10.1016/j.burns.2011.11.006
42. El-Badawy A, Mabrouk AR. Epidemiology of childhood burns in the burn unit of Ain Shams University in Cairo, Egypt. Burns. 1998;24(8):728–32. doi: 10.1016/s0305-4179(98)00097-7
43. Forjuoh SN, Guyer B, Strobino DM, et al. Risk factors for childhood burns: a case-control study of Ghanaian children. J Epidemiol Community Health. 1995;49(2):189–93. doi: 10.1136/jech.49.2.189
44. Delgado J, Ramírez-Cardich ME, Gilman RH, et al. Risk factors for burns in children: crowding, poverty, and poor maternal education. Inj Prev. 2002;8(1):38–41. doi: 10.1136/ip.8.1.38
45. Wang S, Li D, Shen C, et al. Epidemiology of burns in pediatric patients of Beijing City. BMC pediatrics. 2016; 16(1): 1–7. doi: 10.1186/s12887-016-0686-7
46. Niekerk AV, Reimers A, Laflamme L. Area characteristics and determinants of hospitalised childhood burn injury: a study in the city of Cape Town. Public Health. 2006;120(2):115–24. doi: 10.1016/j.puhe.2005.08.015
47. Colvin JD, Richardson T, Ginther DK, et al. Economy-Sensitive Conditions: Are Some Pediatric Hospitalizations Triggered By Economic Recessions? Health Aff (Millwood). 2020;39(10):1783–1791. doi: 10.1377/hlthaff.2020.00732
48. Dinesh A, Polanco T, Khan K, et al. Our Inner-city Children Inflicted With Burns: A Retrospective Analysis of Pediatric Burn Admissions at Harlem Hospital, NY. J Burn Care Res. 2018;23;39(6):995–999. doi: 10.1093/jbcr/iry026
49. Dědovic Z, Brychta P, Koupilová I, et al. Epidemiology of childhood burns at the Burn Centre in Brno, Czech Republic. Burns. 1996;22(2):125–129. doi: 10.1016/0305-4179(95)00106-9
50. Gyedu A, Nakua EK, Otupiri E, et al. Incidence, characteristics and risk factors for household and neighbourhood injury among young children in semiurban Ghana: a population-based household survey. Inj Prev. 2015;21(e1):e71–9. doi: 10.1136/injuryprev-2013-040950
51. Padalko A, Cristall N, Gawaziuk JP, et al. Social Complexity and Risk for Pediatric Burn Injury: A Systematic Review. Journal of Burn Care & Research. 2019;40(4): 478–499. https://doi.org/10.1093/jbcr/irz059
52. Patel DD, Rosenberg M, Rosenberg L, et al. Poverty, population density, and the epidemiology of burns in young children from Mexico treated at a U.S. pediatric burn facility. Burns. 2018; 44(5): 1269–1278. https://doi.org/10.1016/j.burns.2018.02.003
53. Kamal NN. Home Unintentional Non-fatal Injury Among Children Under 5 Years of Age in a Rural Area, El Minia Governorate, Egypt. J Community Health. 2013;38:873–879. doi: 10.1007/s10900-013-9692-y
54. Istre GR, McCoy M, Carlin DK, et al. Residential fire related deaths and injuries among children: fireplay, smoke alarms, and prevention. Inj Prev. 2002;8(2): 128–32. doi: 10.1136/ip.8.2.128
55. Lal ST, Bhatti DJ. Burn injury in infants and toddlers: risk factors, circumstances, and prevention. Indian Journal of Burns. 2017;25(1):72. doi: 10.4103/ijb.ijb_14_17
56. Główny Urząd Statystyczny: Dochody i warunki życia ludności Polski (raport z badania EU-SILC 2014). Warszawa: Zakład Wydawnictw Statystycznych; 2015.