

# THE INFLUENCE OF PARENTAL EDUCATION AND OTHER SOCIO-ECONOMIC FACTORS ON CHILD CAR SEAT USE

## VPLIV IZOBRAZBE STARŠEV IN DRUGIH SOCIALNO-EKONOMSKIH DEJAVNIKOV NA UPORABO OTROŠKEGA AVTOMOBILSKEGA SEDEŽA

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### ABSTRACT

#### Keywords:

child restraint systems, educational status, socioeconomic factors, preschool children

**Introduction.** The behaviour of parents in ensuring car passenger safety for their children is associated with socio-economic (SE) status of the family; however, the influence of parental education has rarely been researched and the findings are contradictory. The aim of the study was to clarify whether parental education influences the use of a child car seat during short rides.

**Methods.** A cross-sectional survey was carried out in outpatient clinics for children's healthcare across Slovenia. 904 parents of 3-year-old children participated in the study; the response rate was 95.9%. A self-administered questionnaire was used. A binary multiple logistic regression was applied to assess the association between parental unsafe behaviour as dependent variable, and education and other SE factors as independent variables.

**Results.** 14.6% of parents did not use a child car seat during short rides. Families where mother had low or college education had higher odds of the non-use of a child car seat than families where mother had a university education. Single-parent families and those who lived in areas with low or medium SE status also had higher odds of the non-use of a child car seat.

**Conclusions.** Low educational attainment influences parents' behaviour regarding the non-use of a child car seat. Low parental education is not the only risk factor since some highly educated parents also have high odds of unsafe behaviour. All parents should therefore be included in individually tailored safety counselling programmes. SE inequalities could be further reduced with provision of free child car seats for eligible families.

### IZVLEČEK

#### Ključne besede:

sistemi za zadrževanje otrok, izobrazba, socialno-ekonomski dejavniki, predšolski otroci

**Uvod.** Vedenje staršev pri zagotavljanju varnosti otrok v avtomobilu je povezano s socialno-ekonomskim (S-E) položajem družine, vendar je bil vpliv izobrazbe staršev proučevan redko, ugotovitve pa so si nasprotujoče. Namen raziskave je bil razjasniti, ali izobrazba staršev vpliva na uporabo otroškega avtomobilskega sedeža.

**Metode.** Izvedena je bila presečna raziskava v ambulantah zdravstvenega varstva otrok po Sloveniji. Sodelovali so 904 starši triletnikov, odzivnost je bila 95,9-odstotna. Uporabljen je bil vprašalnik za samoizpolnjevanje. Za oceno povezanosti neuporabe otroškega avtomobilskega sedeža kot odvisne spremenljivke ter izobrazbe in drugih S-E dejavnikov kot neodvisnih spremenljivk je bila izvedena binarna multipla logistična regresija.

**Rezultati.** Starši niso uporabljali avtomobilskega sedeža na kratkih vožnjah v 14,6% primerov. Večje obete za neuporabo sedeža so imeli v družinah z nizko in višje (1. stopnja) izobraženo materjo v primerjavi z družinami z univerzitetno (2. stopnja) izobraženo materjo, pa tudi v enostarševskih družinah ter na območjih bivanja z nizkim in srednjim S-E položajem.

**Zaključki.** Nizka izobrazba staršev vpliva na njihovo odločitev, da bodo opustili uporabo otroškega avtomobilskega sedeža na kratkih vožnjah. Vendar nizka izobrazba ni edini dejavnik tveganja, saj imajo visoke obete za opustitev varnostnega ukrepa tudi nekateri visoko izobraženi starši. Zato bi bilo treba za vse starše uvesti individualno prilagojeno svetovanje o varnosti otrok v avtomobilu. Neenakosti, pogojene s S-E položajem, pa bi lahko dodatno zmanjšali z brezplačnimi otroškimi avtomobilskimi sedeži za socialno šibke družine.

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## 1 INTRODUCTION

Injuries are the leading cause of death in children older than 1 year in Slovenia and other European countries, wherein preschool children are most vulnerable to traffic accidents (1). Despite the national mandatory child restraint use and scientific evidence that child safety car seat use is highly effective in reducing the risk of fatal and nonfatal injury during traffic collision (2, 3), in Slovenia, up to 20% of children younger than 12 years are not restrained (4).

High mortality and morbidity due to injuries are associated with poverty and material deprivation (5), which increase injury risks because children are exposed to a wider range of hazards due to poor safety of their living environment, while parents have less knowledge and time to implement safety measures and less means to buy safety devices (6). Until now, a relatively small number of studies was published on the relationship between parental safety practices and SE factors, such as low parental educational attainment, unemployment, a single-parent family, and living in poor areas. Some authors report that child safety car seat is used less frequently in families with low income (7, 8) and low parental educational attainment (9, 10), but most studies could not or did not try to prove the association with socio-economic (SE) factors (11-13). Very few studies analysed educational attainment in combination with other SE factors, despite the fact that it could influence parents' ability for injury prevention in children. Parents with higher educational levels are more aware of potential dangers, they can seek out better information on injury prevention in children, and they have better intellectual abilities, more knowledge and greater motivation for intervention (10). We would expect that parental education positively influences their implementation of safety measures, but the findings so far are contradictory. Some authors report that parents with higher education levels use the child safety car seat more often (7, 10, 14), while other studies show that the use of a child car seat is not significantly different in families with lower educated mother (8, 11, 12), or it is even more frequent (15).

The aim of our study was to clarify whether parental education influences the use of child car seat and to assess the extent of its importance compared to other socio-economic factors. A self-administered questionnaire on safety practices was used in a cross-sectional area probability study sample of parents. The findings will contribute to the development of new programmes in the field of safety promotion and reduction of children's health inequalities due to injuries.

## 2 METHODS

### 2.1 Study Design and Participants

An analytical cross-sectional survey was conducted in outpatient clinics for children's healthcare across Slovenia. The study population comprised parents who brought their children for routine well-child visits at the age of three years. The sample was selected by the method of stratified area probability proportionate to size sampling (16) with the choice of 41 clusters with 23 persons. The questionnaire was completed by 904 parents; the response rate was 95.9%. 37 questionnaires (4.1%) were rejected due to child's inadequate age, while 867 questionnaires were eligible for the analysis. Another 16 records were excluded from the final analysis, because families have not got a car. The average age of mothers was 33.0 years, while the average age of fathers was 35.7 years. Other socio-demographic characteristics of participant families are shown in Table 1.

**Table 1.** Socio-demographic characteristics of participant families.

Family characteristics	N	(%)
<b>Mother's age (years)</b>	847	
Less than 29		19.8
30-34		43.0
35 and more		37.2
<b>Father's age (years)</b>	841	
Less than 29		9.0
30-34		34.2
35-39		36.3
40 and more		20.5
<b>Mother's education</b>	849	
Vocational or less		15.5
Secondary		27.1
College		27.1
University		30.3
<b>Father's education</b>	842	
Vocational or less		29.0
Secondary		30.8
College		18.5
University		21.7
<b>Child sequence</b>	848	
First child		49.1
Second and following child		50.9
<b>Number of children</b>	848	
One child		27.8
Two or more		72.2
<b>Gender of the child</b>	850	
Male		51.4
Female		48.6

Family characteristics	N	(%)
<b>Family type</b>	848	
Both parents		75.0
Parents and relatives		22.1
Single-parent family		2.9
<b>Material welfare of the family</b>	844	
Poor		8.9
Medium		81.6
Good		9.5
<b>Type of residence community</b>	842	
Urban		38.7
Suburban		17.7
Rural		43.6
<b>SE status of area of residence</b>	850	
Poor		25.8
Medium		17.9
Good		56.3

## 2.2 Materials

A self-administered questionnaire was developed. Before starting data collection, 12 parents from one of the clinics participated in pilot testing. The final questionnaire was supplemented in accordance with the pilot testing findings and handed to 943 parents.

The questionnaire contained questions on safety practice and potential correlates. Safety practice regarding child car seat use was assessed with the following question: 'How often is your child fastened in a child car seat during 5- to 10-minute rides?' Answers were recorded to a dichotomous outcome (not using - never, less than half times, more than half times, using - always). Parents' behaviour was defined as unsafe in cases when parents did not use a child car seat on every short ride, because a child is only safe when the child car seat is used, which is required by law in Slovenia. Potential correlates of safety practice were: socio-economic status assessed with maternal and paternal educational attainment (vocational or less, secondary, college, university), family type, material welfare of the family (self-assessed as poor - they cannot or can barely cover the usual needs with family income, including social benefits; medium - they cover the usual needs and possibly save some money; good - they easily save a part of the income and make investments), SE status of area of residence (quintiles of income tax base per capita in the municipality were defined as bad - the 1st and 2nd group with the lowest income tax; medium - the 3rd group; good - the 4th and 5th group) and the type of the residence community (self-assessed).

Family and child's characteristics were defined with mother's age, father's age, gender of the child, child sequence, the number of children, parents' knowledge on children's injury prevention (poor - 1/3 of correct answers or less; good) and the source of information (reliable - books, medical staff; questionable - the Internet, magazines, TV; unreliable - friends, relatives, none). The motivational factors were defined on the basis of presumptions of Protection motivation theory (17). The four-point answer scale ('low' to 'very high') was used to measure parents' perception of their children's vulnerability, the severity of a child's injury in a potential accident, safety measure efficacy and self-efficacy. Social norms were measured with the perceived expectations of significant others regarding the importance of safe behaviour ('not so important' to 'very important').

## 2.3 Procedure

In 41 paediatric outpatient study sample clinics, nurses invited parents who brought their three-year-old children for routine well-child visits in May and June 2013 to participate in the study. Parents, who gave their written consent for the participation in the study, filled in the questionnaire by themselves in the waiting room, while waiting for their child's turn for a check-up. The data were gathered by self-administered questionnaires, accompanied by a cover letter, which explained the purposes of the study and why parents' cooperation is important. In case both parents accompanied the child, they only filled in one questionnaire. Parallel answers given by the father and mother of the same child were not requested. Parents sealed up the completed questionnaire in an enclosed envelope and put it in a special box in the nurse's office. The nurse opened the box only after the study data collection was over. In case parents did not wish to participate in the study, they marked the questionnaire accordingly and put it in the box. Parents were given full anonymity because the questionnaire did not include any personal data, which could identify them or their child. The participants did not receive any financial stimulation.

## 2.4. Data Analysis

Categorical variables were described with relative frequencies and continuous variables with mean ones. The association between unsafe behaviour as dependent variable and SE and other factors as independent variables was assessed using binary multiple logistic regression. Dummy variables were created for all observed independent variables in the analysis. The simple method was applied. Three models were fitted: SE factors (Model 1), adjusted for demographic factors (Model 2), and adjusted for demographic, motivational factors and social norms (Model 3). The Hosmer - Lemeshow test was used to perform the assessment of how well each model accounts

for the outcome. For the comparison of three models, the likelihood ratio test was used, wherein Model 1 was a special case of Model 2, and Model 2 was a special case of Model 3. Further analyses were applied to investigate potential interaction effects (effect modification) among individual SE factors and between SE factors and motivational factors / social norms.

P-value  $\leq 0.05$  was considered as statistically significant. SPSS statistical package for Windows Version 21.0 was used for the analysis.

### 3 RESULTS

14.6% of families did not always use a child car seat during short rides. In univariate analysis, families with mothers who had vocational, secondary and college education had significantly higher odds for unsafe behaviour regarding child car seat use compared to families with mothers with university education. The same applied for families with fathers who had vocational and secondary education compared to families with university-educated fathers, as well as for families living in areas with poor and medium SE status compared to families living in areas with good SE status. Other characteristics of participant families associated with unsafe behaviour are shown in Table 2.

After introducing multivariable analysis in Model 1, 2 and 3 (Table 3), the change in OR was substantial for several variables compared to univariate analysis. In Model 1, logistic regression analysis showed a significant association between the non-use of child car seat and vocational maternal education, college maternal education, and medium SE status of the area of residence. When the association between the outcome and SE factors was adjusted for demographic factors, motivational factors and social norms in Model 3, the association with single-parent family type and poor SE status of the area of residence became significant. We have tested potential interaction effects among individual SE factors, and between SE factors and motivational factors / social norms. There were no significant interactions; therefore, the change in ORs is likely to be attributed to confounding. Father's education, material welfare of the family and the type of residential community were not significantly associated with the outcome in none of these three models. Other family characteristics associated with unsafe behaviour are shown in Table 3.

Model 3 showed the best fit to the data of all three analysed models. The inclusion of demographic factors into Model 2 increased the fit of Model 2 compared to Model 1, and further inclusion of motivational factors and social norms into Model 3 increased the fit of Model 3 compared to Model 2 (Table 3).

**Table 2.** Estimates of the prevalence of the non-use of a child car seat ( $N_{\text{tot}}=851$ ), and results of invariable analysis of the association between the non-use of a child car seat and family factors.

	$N_{\text{cat}}$	Not using a child car seat (%)	Univariable analysis	
			OR (95% C.I.)	P-value
<b>Socio-economic factors</b>				
<b>Mother's education</b>				
University	257	7.0	1.00	
College	230	18.7	<b>3.05 (1.71-5.47)</b>	<b>p=0.000</b>
Secondary	230	13.9	<b>2.15 (1.17-3.94)</b>	<b>p=0.014</b>
Vocational or less	132	23.5	<b>4.08 (2.18-7.62)</b>	<b>p=0.000</b>
<b>Father's education</b>				
University	183	8.2	1.00	
College	156	12.2	1.55 (0.76-3.17)	p=0.226
Secondary	259	16.2	<b>2.17 (1.16-4.04)</b>	<b>p=0.015</b>
Vocational or less	244	18.9	<b>2.60 (1.40-4.83)</b>	<b>p=0.002</b>
<b>Material welfare of the family</b>				
Good	80	11.3	1.00	
Medium	689	14.7	1.36 (0.66-2.80)	p=0.411
Poor	75	17.3	1.65 (0.66-4.13)	p=0.281
<b>Family type</b>				
Both parents	636	14.2	1.00	
Parents and relatives	187	15.0	1.07 (0.68-1.69)	p=0.778
Single-parent family	25	24.0	1.92 (0.75-4.93)	p=0.177
<b>SE status of area of resid.</b>				
Good	479	10.9	1.00	
Medium	152	22.4	<b>2.37 (1.47-3.82)</b>	<b>p=0.000</b>
Poor	219	17.4	<b>1.72 (1.10-2.71)</b>	<b>p=0.018</b>
<b>Type of residence community</b>				
Urban	326	13.5	1.00	
Suburban	149	12.1	0.88 (0.49-1.58)	p=0.671
Rural	367	16.3	1.25 (0.82-1.91)	p=0.295
<b>Demographic factors</b>				
<b>Mother's age</b>				
35 years and more	315	12.1	1.00	
30-34 years	364	14.0	1.19 (0.76-1.86)	p=0.454
do 29 years	168	20.2	<b>1.85 (1.11-3.07)</b>	<b>p=0.017</b>
<b>Father's age</b>				
40 years and more	172	15.7	1.00	
35-39 years	305	9.5	<b>0.56 (0.32-0.99)</b>	<b>p=0.046</b>
30-34 years	288	18.4	1.21 (0.73-2.01)	p=0.459
do 29 years	76	17.1	1.11 (0.54-2.29)	p=0.781
<b>Child sequence</b>				
First child	416	11.8	1.00	
Second or latter	432	17.4	<b>1.57 (1.07-2.32)</b>	<b>p=0.022</b>

	N <sub>cat</sub>	Not using a child car seat (%)	Univariable analysis	
			OR (95% C.I.)	P-value
<b>Number of children</b>				
One child	236	14.1	1.00	
Two or more	612	14.7	1.02(0.67-1.57)	p=0.912
<b>Gender of the child</b>				
Female	413	14.3	1.00	
Male	437	14.9	1.05 (0.72-1.54)	p=0.808
<b>Knowledge</b>				
Good	369	12.5	1.00	
Poor	482	16.2	1.36 (0.92-2.01)	p=0.129
<b>Information source</b>				
Books, med. staff	371	12.9	1.00	
Internet, magazines, TV	272	17.6	1.43 (0.93-2.21)	p=0.102
None, friends, relatives	202	13.4	1.03 (0.62-1.71)	p=0.900
<b>Motivational factors and social norms</b>				
<b>Child vulnerability</b>				
High	607	14.2	1.00	
Low	236	15.3	1.09 (0.72-1.66)	p=0.687
<b>Injury severity</b>				
Severe	669	11.2	1.00	
Not severe	161	27.3	<b>2.98 (1.95-4.54)</b>	<b>p=0.000</b>
<b>Safety measure efficacy</b>				
Very effective	731	11.9	1.00	
Not very effective	114	30.7	<b>3.28 (2.08-5.18)</b>	<b>p=0.000</b>
<b>Self-efficacy</b>				
Very self-effective	282	7.8	1.00	
Not very self-effective	565	17.9	<b>2.57 (1.58-4.18)</b>	<b>p=0.000</b>
<b>Social norms</b>				
Very important	637	11.6	1.00	
Not very important	203	23.2	<b>2.29 (1.53-3.44)</b>	<b>p=0.000</b>

N<sub>tot</sub> = total number of observations;

N<sub>cat</sub> = number of parents within the category

**Table 3.** Logistic regression models with odds ratios (OR) and 95% confidence intervals (95% C.I.) of the non-use of a child car seat according to socio-economic and other characteristics of a family.

	Not using a child car seat		
	Model 1 OR (95% C.I.)	Model 2 OR (95% C.I.)	Model 3 OR (95% C.I.)
<b>Socio-economic factors</b>			
<b>Mother's education</b>			
University	1.00	1.00	1.00
College	<b>3.15 (1.62-6.09)***</b>	<b>2.84 (1.43-5.65)**</b>	<b>2.77 (1.31-5.83)**</b>
Secondary	1.89 (0.94-3.78)	1.56 (0.76-3.21)	1.40 (0.64-3.06)
Vocational or less	<b>3.63 (1.71-7.69)***</b>	<b>3.34 (1.53-7.32)**</b>	<b>3.91 (1.67-9.13)**</b>
<b>Father's education</b>			
University	1.00	1.00	1.00
College	0.86 (0.39-1.90)	0.82 (0.36-1.86)	0.73 (0.30-1.79)
Secondary	1.31 (0.65-2.64)	1.28 (0.61-2.65)	1.32 (0.60-2.89)
Vocational or less	1.19 (0.57-2.50)	1.02 (0.47-2.22)	1.01 (0.44-2.29)
<b>Material welfare of the family</b>			
Good	1.00	1.00	1.00
Medium	0.89 (0.41-1.90)	0.84 (0.39-1.84)	0.64 (0.28-1.46)
Poor	0.84 (0.31-2.26)	0.80 (0.28-2.26)	0.51 (0.17-1.57)
<b>Family type</b>			
Both parents	1.00	1.00	1.00
Parents and relatives	0.85 (0.52-1.40)	0.83 (0.50-1.40)	0.84 (0.48-1.49)
Single-parent family	2.12 (0.78-5.77)	2.59 (0.89-7.51)	<b>3.38 (1.09-10.52)*</b>
<b>SE status of area of resid.</b>			
Good	1.00	1.00	1.00
Medium	<b>2.04 (1.22-3.39)**</b>	<b>2.01 (1.18-3.41)**</b>	<b>2.32 (1.30-4.15)**</b>
Poor	1.44 (0.89-2.33)	1.54 (0.93-2.55)	<b>1.87 (1.07-3.23)*</b>
<b>Type of residence community</b>			
Urban	1.00	1.00	1.00
Suburban	0.72 (0.39-1.34)	0.71 (0.37-1.35)	0.64 (0.32-1.29)
Rural	0.99 (0.62-1.57)	0.88 (0.55-1.43)	0.87 (0.52-1.47)
<b>Demographic factors</b>			
<b>Mother's age</b>			
35 years and more		1.00	1.00
30-34 years		1.22 (0.70-2.14)	1.05 (0.57-1.93)
do 29 years		1.87 (0.89-3.93)	1.66 (0.74-3.74)
<b>Father's age</b>			
40 years and more		1.00	1.00
35-39 years		<b>0.53 (0.29-0.99)*</b>	0.62 (0.31-1.22)
30-34 years		1.11 (0.57-2.15)	1.51 (0.73-3.12)
do 29 years		0.85 (0.33-2.20)	0.85 (0.30-2.42)
<b>Child sequence</b>			
First child		1.00	1.00
Second or latter		<b>3.45 (1.76-6.77)***</b>	<b>3.53 (1.73-7.23)***</b>
<b>Number of children</b>			
One child		1.00	1.00
Two or more		0.58 (0.29-1.17)	0.58 (0.27-1.23)



	Not using a child car seat		
	Model 1 OR (95% C.I.)	Model 2 OR (95% C.I.)	Model 3 OR (95% C.I.)
<b>Gender of the child</b>			
Female		1,00	1,00
Male		0.98 (0.64-1.49)	0.97 (0.61-1.54)
<b>Knowledge</b>			
Good		1.00	1.00
Poor		1.24 (0.81-1.92)	1.10 (0.68-1.77)
<b>Information source</b>			
Books, med. staff		1.00	1.00
Internet, magazines, TV		1.24 (0.76-2.01)	1.21 (0.71-2.04)
None, friends, relatives		0.80 (0.46-1.40)	0.81 (0.44-1.49)
<b>Motivational factors and social norms</b>			
<b>Child vulnerability</b>			
High			1.00
Low			0.72 (0.42-1.24)
<b>Injury severity</b>			
Severe			1.00
Not severe			<b>2.35 (1.35-4.10)**</b>
<b>Safety measure efficacy</b>			
Very effective			1.00
Not very effective			<b>2.59 (1.41-4.76)**</b>
<b>Self-efficacy</b>			
Very self-effective			1,00
Not very self-effective			1.69 (0.98-2.93)
<b>Social norms</b>			
Very important			1.00
Not very important			<b>1.72 (1.03-2.87)*</b>
Hosmer Lemeshow goodness of fit test	p=0.989	p=0.572	p=0.923
Likelihood ratio test	p=0.000	p=0.006 (Model 2 : Model 1)	p=0.000 (Model 3 : Model 2)

\* Statistically significant at  $p < 0.05$ ; \*\* Statistically significant at  $p \leq 0.01$ ; \*\*\* Statistically significant at  $p \leq 0.001$

#### 4 DISCUSSION

Our research on the behaviour of parents regarding the implementation of safety measures in families with young children confirmed the assumption that low (vocational) maternal education is significantly associated with the non-use of a child car seat during the short rides; however, the association with father's low education was not significant.

Families with mothers with vocational education had higher odds of not using a car seat during short rides compared to families where mothers had a university degree, which is consistent with the findings of most authors (7, 9, 10, 14). At the same time, our results

reveal significant differences between families with highly educated parents, since families where mothers had a college degree had higher odds of not using a car seat compared to families where mothers had a university degree. Parents with lower education level had significantly worse material status compared to parents with university education; they had less knowledge and were more likely to consult less reliable sources of information on child injury prevention, such as their relatives and friends, which is also reported by other studies (10, 14, 18). After controlling for material status and other factors in the model, it is obvious that other parents' characteristics, which are related to education, also influence the non-use of a car seat. E.g., parents with low education less

frequently believe that child injuries are preventable (19); they have wrong beliefs about the invulnerability of their children (20) and are therefore not aware of the importance of ensuring child safety. The differences between families with less and highly educated mothers could be associated with other components of cultural capital, like embodied knowledge, cognitive abilities, skills and competencies (21), higher trust in one's own efficiency for solving problems and stronger motivation (22) of mothers with university degrees.

Family type was also an important factor for the non-use of a child car seat. Single-parent families had higher odds of not using a car seat than families with both parents, which is consistent with the results of some authors (23), while most of them could not prove this premise (7, 8, 10). Authors report that poor implementation of safety measures in single-parent families is associated mainly with their worse material status (23, 24) and their inability to purchase an expensive child car seat (7, 14). However, our results did not confirm this assumption, because family type was significant despite controlling for material status and other factors. This is probably due to the combination of material and social dimension of deprivation (25). Therefore, the behaviour of single-parent families may be influenced by their weak social networks, which does not offer single mothers enough instrumental support from relatives and friends in terms of child care, child transportation and financial or informational assistance (26). Social isolation could also have a negative influence on the opportunity to borrow a car seat, which is a common way to acquire expensive safety equipment in low-income Slovenian families (27).

The association between the non-use of a child car seat and material status of a family was not significant, even though authors report that the non-use of a child car seat is more frequent in low-income families, since car seats are expensive and families with lower SE status have difficulties buying them (7, 8, 14). The lack of disparity in child restraint use due to different material statuses of families is likely to be a reflection of a good social policy in Slovenia, which may improve poor families' financial abilities to buy child car seats. We also assume that families buy child car seats despite their poor material statuses, or they borrow them from relatives or friends, because this is a necessary prerequisite for following the traffic safety regulation.

Families living in areas with poor and medium SE status had higher odds of not using a child car seat compared to families living in areas with good SE status, which is also reported by other authors (28, 29). Our study confirmed an independent influence of the area SE status, therefore the differences in unsafe behaviour between areas are not only the result of geographical clustering of families with similar characteristics, as claimed by some authors

(30). We assume that families who live in poor areas have less opportunities to borrow child car seats because the 'demand' is higher than the 'offer.' It is also possible that risky behaviour of parents is influenced merely by living in the environment with poor 'culture of safety' and thus those parents are not aware of childhood injury risks (10). In such an environment, people generally believe that injuries can rarely be prevented because they are the result of an unfortunate coincidence. In areas with medium SE status, which were predominantly rural, parents' behaviour might be influenced also by other factors, related to area of residence. E.g., lower seat belt usage was reported in areas with low population density (31) and in areas where drivers had a lower perceived risk of being ticketed (32).

The strength of the study is in high parental responsiveness, which greatly reduces bias due to the self-selection of respondents and corresponding difference reduction in odds of parental unsafe behaviour. The study did not involve the data collection on non-participant parents, therefore we were not able to assess the difference between them and participants; however, educational structures of mothers from the study and from Birth registry (33) are very similar, which indicates good representativeness of the sample. By using multivariable analysis in three models, we were able to show that adding demographic factors, motivational factors and social norms to the basic model of SE factors has improved each model's fit to data. Potential interaction effects among individual SE factors and between SE factors and motivational factors/social norms were not significant; therefore, the change in odds ratios in the models is likely to be attributed to confounding variables. These findings revealed the importance of examining motivational factors and social norms as determinants of parents' behaviour regarding the use of child safety equipment.

The study has some limitations. First, the sample included a small number of single-parent families (3%) compared to the proportion of single women (18%) noted in the Birth registry (33). In the study, we asked with whom the child lived, therefore it is possible that a certain share of single mothers answered that the child and herself were staying with her parents or other relatives - in extended family. We also assume that the status of single women could change in the three-year period after the child was born, and that they possibly lived with partners at the time of the research. Nonetheless, it is realistic to expect that women in single-parent families bring their children to preventive well-child visits less frequently compared to parents from other family types, because of higher work overload and lack of help due to weak social networks (34). Second, a self-administered questionnaire was used, therefore parents might give socially desirable responses about the implementation of safety measures,



which could cause some bias due to the misclassification of the outcome, and reduce the differences in unsafe behaviour. Despite that, we decided to use a self-administered questionnaire, because it ensures better anonymity compared to a personal interview, and thus the respondents are more open about socially undesirable behaviours, even though the questions are about sensitive or threatening health care practices (35). In addition to that, the questionnaire did not include any personal data, which would allow for the identification of the child or parents. Studies so far found a high degree of consistency between self-reported safety practices and actual observations (36), and the prevalence of the non-use of a child car seat in our study was very similar to child restraint use measure on Slovenian roads (4). Therefore, we assume that self-reported data in our study are reliable enough. Third, we were unable to prove the independent influence of child's vulnerability on car seat use. It is possible that some parents did not quite understand the question on the risk of their child to be injured in a car crash, which was asked hypothetically, if a child would not be restrained in a car seat during a car ride. If parents who did use a car seat missed this, they might assess that the risk for their child's injury was small, which could lead to the reduction of differences in car seat use.

The study findings about the impact of SE factors on parents' safeguarding behaviour will contribute to a more effective design and implementation of child passenger safety interventions in Slovenia and other comparable countries. Despite the fact that since 1998, we have a law on the mandatory use of safety seats for children's car transportation in Slovenia, our results show that 15% of parents decide not to use child car seat during short rides, wherein parents' low education is not the only SE risk factor. Highly educated parents and single parents also have higher odds of unsafe behaviour. This is the reason why we need to introduce a new counselling programme for all parents during routine well-child visits (37). We assume that parents underestimate the danger of collision during rides near home, and by this they also underestimate the severity of child's injuries and the effectiveness of a safety car seat, as shown in our results. Therefore, information for the parents should be primarily aimed at clarifying the facts on child passenger injury risk and the effectiveness of the child car seat. For less educated parents, individually tailored injury prevention counselling is recommended, which would be designed according to individual's needs and characteristics, and thus parents will be more motivated and likely to use the car seat even during short rides (38). The most successful programmes include the combination of education and hands-on training on how to properly use the child car seat (39, 40), and they could be implemented during routine well-child visits (37). The advantage of integrating such

programmes into well-child care is that they can reach all families, including the ones that may not be using a car seat and therefore do not seek counselling by themselves (37). Inequalities due to unsafe behaviour associated with financial incapacity and social isolation could be further reduced with the provision and installation of free child car seats (40, 41) for eligible families receiving public assistance and single-parent families.

Motivational factors have a great impact on single-parent families' decision to use the car seat. Thus, further research is needed to understand the facilitators and barriers for parents' safe behaviour, which would significantly contribute to designing more effective child passenger safety promotion interventions for vulnerable families. Some other determinants of parents' behaviour, such as perceived risk of being ticketed, descriptive social norms, availability and accessibility of safety equipment, should be examined too.

## 5 CONCLUSION

Low (vocational) maternal education attainment is associated with unsafe parents' behaviour regarding the use of a child car seat during short rides. However, low maternal education is not the only SE risk factor, since families with college-educated mothers, single parents and families living in areas with poor and medium SE status are associated with the non-use of a child car seat too. In general, the prevalence of the child car seat use is low, thus counselling programmes in combination with hands-on training on how to properly install and use child car seat should be introduced for all parents in the framework of well-child care. Information for the parents should have an emphasis on the facts regarding child passenger injury risk and on the effectiveness of a car seat. Inequalities due to unsafe behaviour associated with low education, financial incapacity and social isolation could be reduced with individually tailored counselling and provision of free child car seats for eligible families and single-parent families.

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## CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

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## ETHICAL APPROVAL

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