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NOTES FROM THE FIELD

Healthcare Providers' Knowledge, Attitudes and Counselling on Injury Prevention for Preschool Children in Croatia

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Abstract Injuries are the leading cause of death for children and young adults in Croatia. Research has indicated that health care providers can be effective in reducing the risk for traumatic injury through anticipatory guidance, but successful guidance requires that providers have injury knowledge and informed safety attitudes. This is the first study in Croatia to identify health care provider's knowledge, attitudes, and practices regarding anticipatory guidance on injury prevention for children. A stratified, random sample of licensed Croatian healthcare providers was mailed a survey, with a response of rate of 39.5 %. Participants included pediatricians, family physicians, gynecologists, each with a focus on primary care, and community nurses. Participants filled out a 15-minute paper-and-pencil survey that tested their knowledge of injury risks and prevention strategies, assessed their safety-prone attitudes, and measured the extent to which they counselled their patients on injury prevention. Pediatricians had the highest knowledge of injury risks and intervention approaches, with an average correct score of six out of ten (significantly higher than all other provider types). Knowledge was highest regarding infant fall risk and lowest for safe sleep positions. Pediatricians and community nurses had the highest safety-prone attitudes. Safety prone attitudes were strongest for transportation safety and weakest for safe sleeping position for all providers. Community nurses reported the highest level of patient counselling, followed by pediatricians. Both factual education and support in translating knowledge into everyday practice are necessary for health care providers. Implementing anticipatory guidance for child safety is a promising approach in Croatia.

Keywords Children · Injury prevention · Anticipatory guidance · Health care providers

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Introduction

Unintentional injuries are the leading cause of mortality for all children and youth over the age of one in high and middle-income countries [1–3]. Injured children under the age of five years are more likely to sustain serious injury and have adverse outcomes than children in primary school [2–4]. Additionally, injuries are the second leading cause of childhood medical expenditure after live birth and pregnancy [5]. These trends identify injury prevention as an important public health priority.

Similar to other high and middle-income countries, Croatia has shown substantial progress in regard to lowering general childhood mortality, primarily due to reductions in deaths from infections and childhood illnesses [2, 6–9]. Although childhood mortality from injuries has also decreased, injuries remain the leading cause of death among children after infancy in Croatia [10]. Among the 38 countries in the WHO European region, Croatia has the

12th highest age-specific death rate from injuries for children [8].

Developed countries in which systematic injury prevention and safety promotion programs are implemented have a lower burden of disease related to injuries than Croatia [8]. Health professionals are ideally positioned to help identify trends in injury incidence and to advocate for injury prevention [8, 11–14]. Anticipatory guidance, in which health care providers share information about prevention is an effective method of improving parents' knowledge, attitudes and behaviour and may contribute to primary prevention of injuries [15–17]. Despite evidence that anticipatory guidance is successful, a small number of studies have explored the background knowledge of health professionals and their role in injury prevention in detail [13, 14]. There are no studies regarding this topic among health care professionals in Croatia.

This study reports on findings from a healthcare provider survey that was developed within a larger project to create a curriculum in anticipatory guidance for primary health care providers. The first step in designing a curriculum is to identify educational needs [18]. The aim of this study was to provide baseline data about knowledge, attitudes and safety advocating behaviour regarding injury prevention/safety promotion for preschool children among Croatian primary health care providers.

Methods

Study Population and Design

All Croatian citizens, children and adults, have a primary healthcare provider that is either chosen by the patient or designated through the government health plan. For mothers and children, these primary healthcare providers include pediatricians, who provide care only to children; family physicians, who provide care to both children and adults; and primary care gynecologists, who provide primary gynecological and reproductive health care to women. Furthermore, community nurses, assigned to patients based on their location of residence, provide primary health care to families in their homes. The study population included a convenience sample of these primary healthcare providers who were licensed to practice in Croatia.

Addresses for all licensed healthcare providers in Croatia were obtained from the Registry of Health Workers [19]. Of the 3,871 licensed health care providers in Croatia, 944 were selected for this survey. This sample size was selected to provide 80 % power for a larger educational study that included participating physicians in this survey. A stratified, random sample of licensed physicians was selected to geographically represent the Republic of Croatia by county and to provide an adequate sample for each type of provider. For example, family physicians were the most common type of licensed provider, and a smaller proportion of all family physicians was selected into the sample than for healthcare provider types that were less frequent. The eligible sample consisted of 236 pediatricians (100 % of those practicing at the primary level of healthcare), 112 (52 %) primary care gynecologists, 409 (51 %) community nurses and 187 (7 %) family physicians. Providers were randomly selected from each region in Croatia without regard to age, length of practice, or type of facility of practice.

Between May and July, 2007 the anonymous, self-administered paper-and-pencil survey was mailed to the offices of the licensed providers. The survey included a cover letter that described the study and a pre-addressed, pre-stamped return envelope. No compensation was provided. Return of the survey was considered consent to participate. A total of 373 returned, completely filled out surveys were included in the analysis, for an overall response of 39.5 %.

Survey Instrument

The survey included 46 questions and took approximately 15 min to complete. The survey included questions about the primary health care provider's demographics (age, gender, and length of time in practice) and practice characteristics. The survey was subdivided into three sets of questions that addressed safety knowledge, attitudes, and behaviours. Ten multiple-choice questions with 5 potential answers about safety knowledge were developed based on the burden and leading causes of childhood injury in Croatia. Eight questions asked about safety attitudes with potential answers of "agree" and "disagree". As there are no established questionnaires regarding safety attitudes adapted for the Croatian population, the authors devised the questions based on their professional experience and knowledge. Nine questions asked participants to describe the frequency with which they provided injury prevention/safety promotion advice to their patients. These questions had five-point Likert scale responses that were categorized for analysis as "always/often," "sometimes," and "very rarely/never." This section was not included on the survey for gynecologists because they do not treat the families after the children are born.

Analysis

Responses from the knowledge questions were categorized into correct and incorrect scores, with non-responses considered incorrect, and a total score was calculated by

summing the number of correct responses. Pearson Chi-square tests were used to test the distribution of correct responses for each question and the overall scores, comparing types of healthcare providers. Responses from the attitude and behavioural questions were compared between the healthcare professional types, and Pearson Chi-square tests for association were calculated using pediatricians as the comparison group with the other types of providers. Gynecologists were excluded from the behavioural questions because the anticipatory guidance behaviour questions were not included in their survey. Data analyses were performed using SAS 9.2.

Results

Participants

The sample consisted of 175 community nurses, 51 family physicians, 29 gynecologists, and 91 pediatricians. Community nurses and family physicians had a significantly younger age distribution than gynecologists or pediatricians. Pediatricians reported the highest percentage of physicians age 50 or over (64.1 %) compared with gynecologists (50 %), family physicians (31.3 %) and community nurses (36.3 %). Family physicians and pediatricians reported the longest experience in their practice, with 72.3 % of family physicians and 65.5 % of pediatricians reporting having practiced for at least 15 years. However, differences in length of practice did not differ significantly by provider type.

Injury Prevention Knowledge

More than 80 % of respondents, in all four groups of health care providers, correctly identified injury as the leading cause of child mortality after infancy (Table 1). In contrast, less than a third of respondents correctly identified the number of injury related deaths in Croatia, with pediatricians providing the highest proportion of correct responses (35.7 %). Even though nearly 90 % of providers identified methods to properly store chemicals in a household, fewer than 20 % of respondents correctly identified medications as the most common cause of poisoning for children in Croatia and fewer than 10 % of examinees correctly identified all of the listed potential causes of poisoning. The question that yielded the lowest overall percentage of correct answers asked about the safest sleeping position for an infant; pediatricians had the highest percentage of correct answers, with only 16.7 % answering correctly.

Table 1 Health care provider responses to knowledge questions about injury prevention in Croatia, 2009

Questions	Community nurse (n = 175) n (% Correct)	Family physician (n = 51) n (% correct)	Gynecologist (n = 29) n (% Correct)	Pediatrician (n = 91) n (% Correct)	*p* value
Injuries in Croatia					
Leading cause of child mortality after 1st year of life in Croatia	146 (83.4)	48 (94.1)	24 (82.8)	79 (86.8)	0.26
Number of children aged 0–19 years that lost their lives due to injuries	31 (17.7)	14 (27.5)	10 (34.5)	19 (20.9)	0.19
Leading causes of injury mortality among children aged 1–4 years	114 (65.1)	29 (56.9)	20 (69.0)	65 (71.4)	0.47
Poisonings					
Most common cause of poisoning among children	20 (11.4)	7 (13.7)	4 (13.8)	17 (18.7)	0.45
Proper storage of household chemicals in house with children less than 5	157 (89.7)	44 (86.3)	24 (82.8)	85 (93.4)	0.32
Common causes of childhood poisoning	8 (4.6)	3 (5.9)	2 (6.9)	10 (11.0)	0.26
Sleep					
Safest infant sleep position is/are	2(1.1)	5 (9.8)	2 (6.9)	16 (17.6)	<0.01
Falls					
Baby walker with wheels is a falling risk	157 (89.7)	38 (74.5)	18 (62.1)	84 (93.3)	<0.01
Preventing falls while changing newborn's diaper on tall surface	174 (99.4)	50 (98.0)	26 (89.7)	89 (97.8)	0.1
Supervision					
While shopping in mall parent of a child less than 5	163 (93.1)	47 (92.2)	21 (72.4)	86 (94.5)	0.002
Mean overall % correct[a]	55.8	56.3	52.8	60.8	

[a] Compared with Pediatricians, all other provider types had significantly reduced scores ($p < 0.02$)

Pediatricians had the highest overall mean score (60.8 %), followed by community nurses and family physicians. Pediatricians had significantly higher scores than all other provider types.

Injury Prevention Attitudes

Four out of the eight questions had no more than one non-safety prone response in any of the provider groups (Table 2). This included two questions regarding safety when transporting a child in a motor vehicle, one regarding supervision of a child in a bathtub and one regarding playground safety. Providers had over 90 % agreement with the safer attitude for the pedestrian safety question. However, providers had less safety-prone attitudes about sleep position and poisoning.

The differences in attitudes among types of healthcare providers were significant for three questions. The first question asked if it is a good idea for a mother to sleep with her infant on the same bed after breastfeeding: 8.9 % of pediatricians, 14.6 % of community nurses, 15.7 % of family physicians and 24.1 % of gynecologists agreed with this statement (which is not safety promoting). The difference between the pediatricians' and gynecologists' answers was statistically significant ($p = 0.03$). The two poisoning questions had low safety-prone attitudes and high variation among providers. A significantly higher proportion of gynecologists (35.7 %) than pediatricians

Table 2 Attitudes towards safety behaviors among Croatian health care providers, 2009

Questions	Total	Pediatrician n = 91 n (%)	Community nurse n = 175 n (%)	Family physician n = 51 n (%)	Gynecologist n = 29 n (%)
Car transportation					
Preschool children can sit in the front seat if mother/other adult holds him/her on lap					
Agree	1 (0.3)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)
Disagree	344 (99.7)	91 (100.0)	173 (99.4)	51 (100.0)	29 (100.0)
Small children can stand between the front seats of a car while driving as long as they hold on					
Agree	1 (0.3)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)
Disagree	345 (99.7)	91 (100.0)	174 (99.4)	51 (100.0)	29 (100.0)
Supervision					
Baby that can sit w/o observance can be left alone for few minutes in the bathtub					
Agree	2 (0.6)	0 (0.0)	1 (0.6)	0 (0.0)	1 (3.4)
Disagree	344 (99.4)	91 (100.0)	174 (99.4)	51 (100.0)	28 (96.6)
Playground safety					
Nothing dangerous can happen on a child's playground					
Agree	1 (0.3)	1 (1.1)	0 (0.0)	0 (0.0)	0 (0.0)
Disagree	345 (99.7)	90 (98.9)	175 (100.0)	51 (100.0)	29 (100.0)
Pedestrian Transportation					
By the age of 5 years a child can cross the street alone					
Agree	9 (2.6)	2 (2.2)	3 (1.7)	3 (5.9)	1 (3.4)
Disagree	337 (97.4)	89 (97.8)	172 (98.3)	48 (94.1)	28 (96.6)
Sleep					
Is a good idea for mother to lie down on sofa & sleep with her baby after breastfeeding					
Agree	48 (14.1)	8 (8.9)	25 (14.6)	8 (15.7)	7 (24.1)[b]
Disagree	293 (85.9)	82 (91.1)	146 (85.4)	43 (84.3)	22 (75.9)
Poisoning					
If preschool children are told not to touch medications, they will not touch them					
Agree	64 (18.7)	17 (18.7)	27 (15.5)	10 (20.0)	10 (35.7)[c]
Disagree	279 (81.3)	74 (81.3)	147 (84.5)	40 (80.0)	18 (64.3)
If a child swallows a poisonous substance it is important to provoke vomiting					
Agree	177 (52.4)	30 (34.1)	105 (61.8)[a]	20 (39.2)	22 (75.9)[d]
Disagree	161 (47.6)	58 (65.9)	65 (38.2)	31 (60.8)	7 (24.1)

[a] $p < 0.0001$; [b] $p = 0.03$; [c] $p = 0.04$; [d] $p = 0.003$

($p = 0.04$) reported that pre-schoolers would not touch medications if told not to. More than 75.9 % of gynaecologists agreed that vomiting should be induced when a child swallows a poisonous substance (which is not advised), compared with only 34.1 % of pediatricians ($p = 0.003$).

Anticipatory Guidance

Healthcare provider's reported counselling is shown in Table 3, with the items appearing in decreasing order of the percentage of Pediatricians who counselled on the topic. Gynecologists were excluded because their survey

Table 3 Safety counseling practices in injury prevention and safety, reported by Croatian health care providers, 2009

How often do you counsel patients on the following topics?	Total	Pediatrician n = 91 n (%)	Community nurse n = 175 n (%)	Family physician n = 51 n (%)	*p* value
Choking—pointed out danger of small objects					
Never/once in awhile	21 (6.6)	6 (6.6)	9 (5.1)	6 (11.8)	0.006
Sometimes	30 (9.5)	11 (12.1)	9 (5.1)	10 (19.6)	
Often/always	266 (83.9)	74 (81.3)	157 (89.7)	35 (68.6)	
Falls—warned parents to danger of falls from height					
Never/once in awhile	25 (8.0)	7 (7.9)	9 (5.2)	9 (17.7)	0.016
Sometimes	55 (17.5)	20 (22.5)	25 (14.4)	10 (19.6)	
Often/always	234 (74.5)	62 (69.7)	140 (80.4)	32 (62.7)	
Poisoning—warned parents not to keep chemicals outside of original packages without proper labels					
Never/once in awhile	51 (16.1)	15 (16.7)	23 (13.1)	13 (25.5)	0.036
Sometimes	51 (16.1)	13 (14.4)	25 (14.3)	13 (25.5)	
Often/always	214 (67.7)	62 (68.9)	127 (72.6)	25 (49.0)	
Falls—recommended putting protective fence on stairway					
Never/once in awhile	36 (11.4)	21 (23.1)	4 (2.3)	11 (21.6)	0.0001
Sometimes	32 (10.1)	14 (15.4)	12 (6.9)	6 (11.8)	
Often/always	249 (78.6)	56 (61.5)	159 (90.9)	34 (66.7)	
Electrocution—recommended putting protection on electric sockets					
Never/once in awhile	29 (9.2)	17 (18.7)	5 (2.9)	7 (13.7)	0.0001
Sometimes	49 (15.5)	21 (23.1)	19 (10.9)	9 (17.7)	
Often/always	238 (75.3)	53 (58.2)	150 (86.2)	35 (68.6)	
Supervision—recommended locking front/yard gate					
Never/once in awhile	40 (12.6)	19 (20.9)	11 (6.3)	10 (19.6)	0.0004
Sometimes	53 (16.7)	21 (23.1)	25 (14.3)	7 (13.7)	
Often/always	224 (70.7)	51 (56.0)	139 (79.4)	34 (66.7)	
Poisoning—checked out where household chemicals/meds are stored					
Never/once in awhile	109 (34.8)	41 (46.0)	47 (27.2)	21 (41.2)	0.028
Sometimes	78 (24.9)	16 (18.0)	50 (28.9)	12 (23.5)	
Often/always	126 (40.3)	32 (36.0)	76 (43.9)	18 (35.3)	
Burns/scalds—recommended reducing boiler temperature					
Never/once in awhile	153 (48.4)	54 (59.3)	68 (39.1)	31 (60.8)	0.006
Sometimes	72 (22.8)	14 (15.4)	50 (28.7)	8 (15.7)	
Often/always	91 (28.8)	23 (25.3)	56 (32.2)	12 (23.5)	
Poisoning—recommended installation of CO detector in households with higher risk					
Never/once in awhile	214 (67.9)	61 (67.1)	116 (67.0)	37 (72.5)	0.39
Sometimes	45 (14.3)	10 (11.0)	30 (17.3)	5 (9.8)	
Often/always	56 (17.8)	20 (22.0)	27 (15.6)	9 (17.7)	

* 12 Missing responses were excluded from the table

did not include these questions. More than 80 % of pediatricians and community nurses and nearly 70 % of family physicians reported that they "often or always" provided anticipatory guidance about choking on small objects. More than 60 % of pediatricians and family physicians and more than 80 % of community nurses provided guidance on the two fall-related topics.

Three questions addressed poisoning. The most frequent counselling was given to warn parents not to store chemicals outside of their original packages, although 25.5 % of family physicians reported counselling "never or only once in awhile." Over 40 % of respondents counselled "never or only once in awhile" on storage of household chemicals and medications. Installation of carbon monoxide detectors was the topic with the least reported guidance: more than 65 % of all providers addressed this topic "never or only once in awhile."

Community nurses provided the most anticipatory guidance on injury prevention and childhood safety, and had the highest responses of "often/always" for all topics except one. The lone exception was for counselling to install a carbon monoxide detector, which received the lowest counselling of all topics on the survey.

More than half of pediatricians reported that they provided anticipatory guidance "often or always" about falls from heights, proper labelling of chemicals, protecting stairways, protecting electric sockets, and locking the front yard/gate. Fewer than half of pediatricians reported "often or always" counselling to check how household chemicals were stored, to recommend lowering the water-heater temperature, and to install carbon monoxide detectors. Family physicians provided the lowest level of anticipatory guidance for all but three topics: installing protective fences on stairways, protecting electrical sockets, and locking front yard gates. For these three topics, family physician's responses fell between pediatricians and community nurses.

Discussion

Injuries are one of the most critical health issues among children in Croatia, especially when compared to other developed countries in the region [8, 20]. We found that pediatricians were more knowledgeable about injuries compared with other health care providers, and gynecologists had the lowest knowledge scores. Education on injury prevention in medical schools is fragmented and infrequent [21] which is a possible explanation of the variability in knowledge found in our study. Pediatricians, family physicians and community nurses have an important role as advocates for and providers of preventive and health promoting activities for their designated population —including preschool children. Although gynecologists share this mandate, they may not perceive children after birth as "their" population. However, gynecologists in Croatia play a crucial role in preparing the parents for the arrival of a new child, which ideally positions them to raise awareness about safety and to eliminate hazards before the child is born.

Community nurses were the most likely to report that they provide counselling on injury preventive/safety promoting behaviour, yet their knowledge was among the lowest and their attitudes were among the least safety-prone. Kendrick et al. [22] found the opposite: nurses had adequate knowledge of safety risks but described their own counselling behaviour as lacking. Barkin et al. [23], however, did not find that healthcare providers' knowledge influenced anticipatory guidance provision. Links between knowledge and behaviour may be influenced by culture. In Croatia, community nurses have the most access to families within their homes, where according to available literature a substantial number of injuries occur. They provide information on injury prevention and safety, but our results indicate that they are inadequately prepared for this role.

In our study, knowledge, safety-prone attitudes and counselling on the topic of poisoning stood out as being low, which is inconsistent with trends among physicians in the United States and in conflict with the high frequency and burden of poisoning injury [23, 24]. Infant sleeping position also had low safety-prone attitudes. At international levels, "back-to-back" campaigns have received much social marketing attention and the low levels of agreement with this item is in contradiction to the pervasiveness of these messages. Providers also had high acceptance for mothers to nap with their infant in the same bed after breastfeeding. These attitudes may explain why sudden infant death syndrome (SIDS) has been among the top ten single diagnosed causes of infant mortality through over a decade in Croatia, which is not a case in most developed countries in Europe [25].

We found that one of the items for which healthcare providers reported infrequent counselling was lowering the water heater temperature. A 1993 critical review by Bass et al. [15] found that parents prefer strategies that are convenient to use, inexpensive and require only one action—a perfect example of which is lowering water heater temperature. Since scald injuries are painful, require a long recovery period, and have potential for permanent scarring, this is an important message for future focus.

This study has several limitations. Our response rate was 39.5 %, which was low and may indicate selective reporting among those who have an interest in this topic. The level of representation of the participating sample to the larger population of health care providers is not known because demographic information is not available for all

providers. A cross-sectional study has the inherent limitation of presenting a single time point and does not indicate changes in knowledge, attitudes or behaviour over time. Also, there is a possibility that the participants would attempt to adhere to perceived social norms when self-reporting knowledge, attitudes and behaviours [26].

We found that health care providers had diversity in their knowledge, attitudes and behaviour on injury prevention, and we also found variability in responses based on different types of injuries. These findings have important implications for future action. Further research on health care provider counselling should be aimed at specific injury prevention and safety promoting activities. Furthermore, our findings by injury types provide an evidence-based background for very specific policies and measures to address particular problems. Research shows that adequate leadership, infrastructure and capacity strongly negatively correlated to child injury mortality ranking [27]. Enhancing our capacity to prevent childhood injuries and increasing knowledge, attitudes and behaviours regarding children's safety should be a high priority for Croatia.

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