



Original research article

First aid knowledge and skills of primary school teachers in Hungary

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Abstract

Background: The aim of the research was to measure the first aid knowledge, experiences, attitudes and skills of teachers within the framework of an educational experiment.

Methods: The target group were teachers working in the primary schools of Baranya County, Hungary. A total of 156 teachers ($N = 156$) participated in the study, which included a self-constructed questionnaire. 132 of the teachers ($n = 132$) also attended a first aid training. Statistical analysis was made by descriptive statistics, one/two-paired T -test and ANOVA. A p -value less than 0.05 was considered to be statistically significant.

Results: On average, educators achieved a 78.33% result in the assessment of first aid knowledge, but only 38.15% for their practical skills. Based on the results, there were several injuries occurring in the city (672) and at the lower section (498) during one academic year. Participants achieved significantly better results after education on all topics taught than before ($p < 0.001$).

Conclusions: The level of first-aid knowledge is adequate among teachers, but in many cases, this does not align with their practical skills. However, the large number of school accidents requires competent teachers in care. The educational experiment had a significant positive impact on the knowledge and skills of educators. This justifies the motivation of teachers and their ability to master professional care.

Keywords: First aid knowledge; First aid skills; First aid training; Teachers

Introduction

Various accidents and illnesses cause serious health care problems worldwide. In the majority of these emergency cases, laypeople are first at the scene. Accidents are one of the most common leading causes of death in childhood (Borse et al., 2008). In Hungary, 26% of 1,222 childhood accidents occurred between the ages of 7–14 (primary school age group). Nine percent of these cases occurred at school (Bényi et al., 2003). Approximately 6,000 accidents occur in Hungarian public education institutes every year, according to the Ministry of National Resources (Páll, 2011).

Quick and high quality first aid can improve the chance of survival. The willingness to help is low worldwide, but can be increased with first aid training (Oliver et al., 2014; Tannvik et al., 2012; Urban et al., 2013). In countries with higher quality and regular first aid and resuscitation training, outcomes are better. Teaching first aid and resuscitation in early childhood can be useful to increase the number of bystanders who can act in an emergency situation (Cave et al., 2011; Böttiger and Van Aken, 2015; De Buck et al., 2015; Plant and Taylor, 2013). Children spend a lot of time in schools, so teachers can

play an important role in real emergency situations, and can also be trainers, teaching children first aid (Beck et al., 2016; Breckwoldt et al. 2007). Schoolteachers are willing to teach Basic Life Support (BLS), but they need more and better training. Teachers agree with the inclusion of first aid training in schools and university degree programmes aimed at training teachers/undergraduate teaching degrees (Abelairas-Gomez et al., 2021). Another study states that circumstances which require medical attention are common in schools. Teachers are often the first to witness and handle situations requiring first aid and medical emergencies. Therefore, measures need to be taken at schools to ensure the initiation of first aid training, followed by periodic training for teachers in first aid. A study by Alharbi et al. (2016) revealed that the majority of school teachers do not have adequate knowledge of CPR. The authors recommended the mandatory implementation of CPR and basic life-support training, as well as refresher courses for all school teachers.

Another study concluded that a first aid training program for teachers was effective, leading to a significant increase of knowledge and improvement of skills regarding first aid management of selected minor injuries among study participants (Masih et al., 2014). The findings of previous studies

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emphasize the need for first aid training programs for teachers (Abelairas-Gomez et al., 2021; Alharbi et al., 2016; Joseph et al., 2015; Masih et al., 2014). However, little is known about first aid knowledge, skills, and the attitude of primary school teachers in Hungary (Bánfai et al., 2020).

The aim of our study was to assess the knowledge and skills of teachers working at primary schools in Baranya County, Hungary. They were analysed in the context of situations requiring first aid, which often occur in primary school environments, such as a collapsed/unconscious child, wound care, controlling severe bleeding, dislocations, sprains, fractures, and emergency calls. A further aim was to examine the effectiveness of a first aid training for teachers, which contained different first aid related skills and situations. In addition, we wanted to get to know the attitude of the teachers in first aid settings, the factors motivating and inhibiting their first aid, as well as self-assessment of their own level of knowledge.

Materials and methods

Participants

Five primary schools (two urban and three rural) in Baranya County, Hungary, were selected to participate in our longitudinal study. In Hungary, primary schools comprise 8 classes: 1–4 classes are lower section, 5–8 classes are upper section. Our study was completed in Pécs, Mohács, Majs, and Olasz, between March and December 2017. The target group were teachers teaching in primary schools. Written consent was given before participation. Both the selection of schools and the teachers was based on voluntary participation. There were 156 participants in the questionnaire survey, while 132 teachers were involved in the first aid training.

Study design and data collection

Data were collected via a questionnaire, skills assessment, and observation based on the educational intervention. The self-constructed questionnaire was divided into four main sections: socio-demographic questions, previous first aid training/experience questions, self-assessment questions, and knowledge control questions. The socio-demographic questions focused on the age, gender of respondents, the type of settlements where the respondents taught, the level of their educations, the educated sections, the time spent on the teaching career, and taught subjects. They also focused on the presence of a school doctor on a day-to-day basis in the respondent's school, as well as the availability of a teacher who is able to perform first aid. Questions relating to first aid trainings/experiences were focused on: participation in first aid training, the framework of training, the provided knowledge and teaching materials, satisfaction with training, the modality of the final exam, a willingness to participate in a future first aid course, personal motivators and inhibitors of first aid, and whether the respondent had already been in a situation requiring first aid in his/her career. The latter also included a table related to the real-life first aid situations during the school year of 2016/17. The self-assessment questionnaire included a five-grade self-assessment scale for estimating its own level of knowledge, and a three-stage scale to assess first-aid self-confidence. The exploratory questions were related to nosebleeds, potential spinal injuries, bruised wounds, arterial/venous bleeding, fainting/unconsciousness, fracture/sprains/dislocations, as well as knowledge of emergency calls. The multiple-choice questions (15) designed to monitor knowledge (2 points were given if the answer was correct). It was possible

to choose "it is not the most harmless but not the most appropriate treatment" (1 point) as an answer, or a particularly harmful supply (0 points). Answering all of the questions correctly meant a maximum of 30 points. At the end of the questionnaire, there was a question related to willingness to participate in the educational experiment.

During the one-day training programme, the pre- and post-measurement provided a framework for the mentioned educational training. Participants had to solve five simulated situations individually in the following topics: management of an unconscious child, nose bleeds, abrasions, stopping bleeding, and the management of a sprain. The pre-test was followed by training, which contained theoretical and practical elements. After the training each participant received personalized feedback, and assistance with the correction of any errors. After the test there was a de-briefing. Participants were given the maximum of nine points in the topic of faint and a sprain, the use of compression bandages, maximum of eight point for the nose bleed, and the maximum of six points for the wound management. In this manner, teachers could achieve a total of 41–41 points on the pre- and post-measurement.

Statistical analysis

Statistical analysis was conducted using SPSS 24.0 (Statistics Package for Social Sciences, Chicago, IL, USA) statistical software. Descriptive statistics were created (percentage, mean, standard deviation, mode, median) to describe the sample. A *t*-test and ANOVA was used to evaluate the association between effectiveness of first aid, and demographic characteristics (sex, age, education level, location of the school, teaching on lower/upper section, time of teaching). A *p*-value less than 0.05 was considered to be statistically significant.

Results

Characteristics of the sample

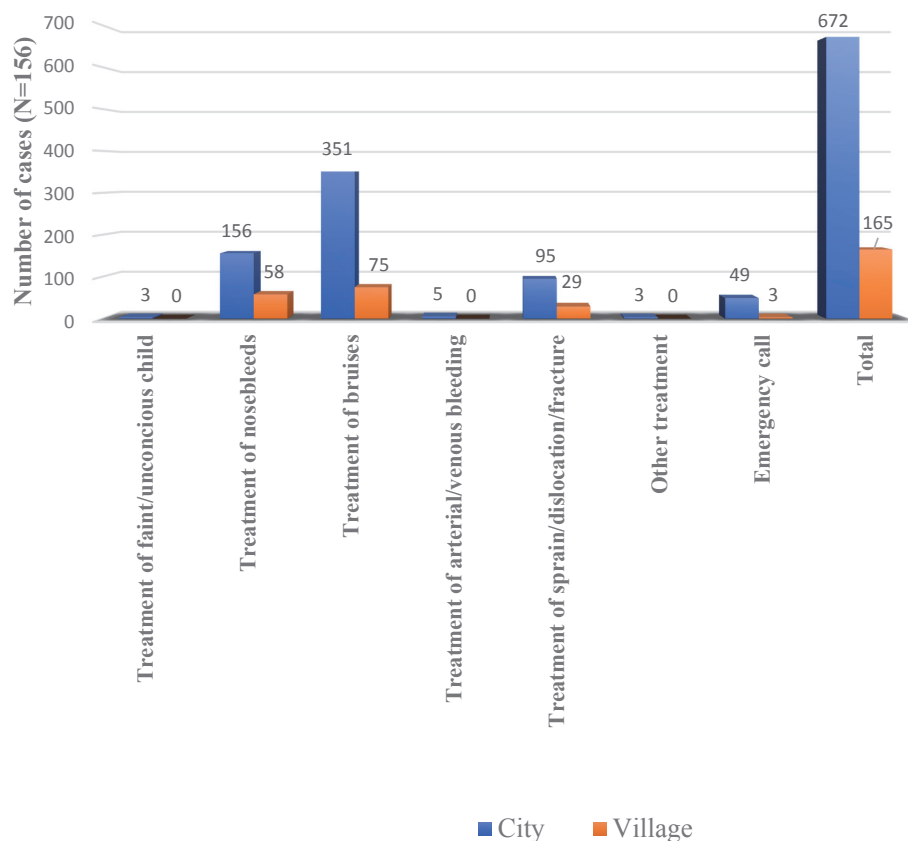
156 completed questionnaires were returned of the distributed 160, representing a 97.5% fill rate. 132 teachers participated in the educational experiment. Teachers aged 36–50 years participated in the highest proportion, while the lowest proportion belonged to the 20–35 age group. The majority of this sub-sample taught in elementary school in the city (47%). The proportion of people working in villages is slightly lower, and higher in county towns. Teachers with bachelor's degree and primary school teachers participated in higher ratio on the practical training. Regarding the composition of the surveyed teachers, there is also similarity between the subjects taught and the time spent in the field. The participants of the educational experiment spent on average 21 years in the teaching field. The socio-demographic data of teachers in the research are shown in Table 1.

Results of the questionnaire

As part of the questionnaire, teachers indicated how many real time first aid cases academic year of 2016/17 were performed (fainting/unconsciousness, nose bleeding, abrasion, arterial/venous bleeding, supply of sprain/ dislocation/fracture, emergency call, other care). Based on the analysis, a total of 672 first aid related cases in urban schools and 165 cases in rural schools occurred during this time period. Of the data in a given school year, we found that teachers located in cities at 672 cases, and village teachers at 165 cases got into a situation where first aid was needed. The frequency of treatments in schools, in relation to the type of school settlement, can be seen in Fig. 1.

Table 1. Socio-demographic data of teachers in the research (N = 156)

		Questionnaire survey				Educational experiment			
		Person	%	Total		Person	%	Total	
				Person	%			Person	%
Gender	female	129	82.7	156	100	107	81.1	132	100
	male	27	17.3			25	18.9		
Age group	20–35 years	20	12.8	156	100	18	13.6	132	100
	36–50 years	73	46.8			62	47.0		
	over 50 years	63	40.4			52	39.4		
Type of settlement of school	village	44	28.2	156	100	33	25.0	132	100
	city	69	44.2			58	43.9		
	county seat	43	27.6			41	31.1		
Education	college	128	82.1	156	100	106	80.3	132	100
	university	28	17.9			26	19.7		
Taught section	lower section	83	53.2	156	100	71	53.8	132	100
	upper section	73	46.8			61	46.2		
Taught subject	biology and/or physical education	18	11.5	156	100	13	9.8	132	100
	leading day-care	10	6.4			8	6.1		
	other	128	82.1			111	84.1		
Time spent in teaching career	1–15 years	50	32.1	156	100	45	34.1	132	100
	16–30 years	57	36.5			48	36.4		
	31–45 years	49	31.4			39	29.5		

**Fig. 1.** Frequency of treatments in schools, depending on the type of school settlement

Comparing the average numbers of real first aid cases in the urban and rural schools, we could see that 6 cases/teacher in urban and 3.75 cases/teacher occur in one academic year. We also analysed the frequency of listed supplies, depending on the taught section. According to this, in the 2016/17 ac-

ademic year, teachers of lower sections provided first aid in 498 cases at school, while upper section teachers provided it to 339. The frequency of treatments in schools in relation to the taught section can be seen in Fig. 2.

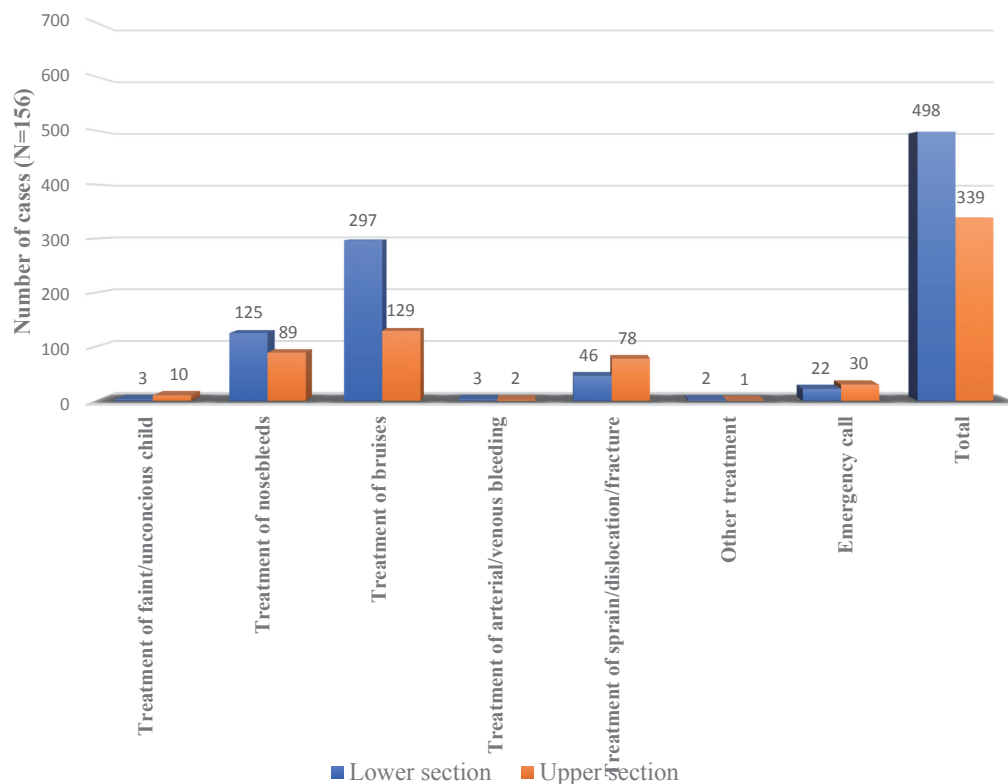


Fig. 2. Frequency of treatments in schools, depending on the taught section

The lower section teachers had 6 real first aid cases/year, while the upper section teachers had 4.64 cases on average. There was no significant difference between the average scores of women (7.38 points; SD: 1.74) and men (6.74 points; SD: 1.16) ($p = 0.070$). The comparison of teachers' first-aid knowledge, according to socio-demographic factors, is shown in Table 2.

Results of the educational experiment

We only measured the basic knowledge/skills that are required daily school life, and which are essential for the prevention of further health damage. Prior to the training, only 6.4% of respondents were able to manage severe bleeding correctly. In the pre-test, nobody could achieve the maximum of 9 points related to the treatment of the unconscious child. 17.42% of the respondents were able to reach the maximum 8 points before the educational intervention. Before the training, only 7 people could get the total 7 points, for the tasks related to sprain / dislocation / fracture care. Based on this, 5.3% of the participants could provide professional care in the previously mentioned topics (sprain/dislocation/fracture). According to the pre-assessments, 3.03% of the teachers were able to provide modern and up-to-date management for wound care. The average pre- and post-measurement scores that teachers received during first aid training are shown in Table 3.

The first aid skills of teachers were also analyzed according to socio-demographic data. According to this, we found a significant difference between the skills related to the unconscious patient and the type of school settlement ($p = 0.021$). A comparison of first aid skills of teachers in relation to socio-demographic factors in pre-measurements is shown in Table 4.

In the situation measurement, rural teachers achieved 4.09, urban teachers 3.19, county seat teachers 2.89 points, out of the maximum available 9 points. Among the skills of groups formed on the taught subjects, there was a significant difference ($p = 0.019$) in the treatment of sprain/dislocation/fracture. Here, the result was the opposite of the knowledge assessment: the average points achieved by other subjects teachers was the highest: 3.74 points (SD: 2.14), day-care leading teachers 2.75 points (SD: 1.58), while biology and / or physical education teachers scored only 2.15 points (SD: 1.35) of the maximum 9 points. The result of the ANOVA test, which was used to compare the average scores obtained after post-measurement, revealed that the teachers' skills showed a significant difference according to the type of school location. The comparison of teachers' first-aid knowledge in relation to socio-demographic factors in post-measurements are shown in Table 5.

Table 2. Comparison of teachers' first-aid knowledge, according to socio-demographic factors (N = 156)

First-aid knowledge		Fainting / unconsciousness		Bleed control/ wound care		Sprain/ dislocation/ fracture		Emergency call		Total		
Sociodemographic factor		mean	p-value	mean	p-value	mean	p-value	mean	p-value	mean	SD	p-value
Gender	female	3.54		7.38		9.11		3.57		23.59	3.76	
	male	3.59	0.688	6.74	0.070	9.33	0.438	3.41	0.318	23.07	2.39	0.367
	cumulative	3.55		7.27		9.15		3.54		23.50	3.56	
Age group	20–35 years	3.25		7.75		9.80		3.95		24.75	2.25	
	36–50 years	3.55		7.21		8.84		3.63		23.22	4.16	
	over 50 years	3.64	0.084	7.19	0.387	9.30	0.076	3.30	0.001*	23.43	3.07	0.231
	cumulative	3.55		7.27		9.15		3.54		23.50	3.56	
Type of settlement of school	village	3.57		7.11		9.02		3.09		22.80	4.30	
	city	3.41		7.01		9.35		3.75		23.52	3.28	
	county seat	3.74	0.034*	7.84	0.029*	8.95	0.469	3.65	<0.001*	24.19	3.07	0.191
	cumulative	3.55		7.27		9.15		3.54		23.50	3.56	
Education	college/BA degree	3.50		7.31		9.16		3.62		23.59	3.76	
	university/MA degree	3.75	0.020*	7.07	0.490	9.11	0.898	3.18	0.037*	23.11	3.11	0.521
	cumulative	3.55		7.27		9.15		3.54		23.50	3.56	
Taught section	lower section	3.41		7.52		9.16		3.77		23.86	3.04	
	upper section	3.70	0.007*	6.99	0.046*	9.14	0.947	3.27	<0.001*	23.10	4.06	0.185
	cumulative	3.55		7.27		9.15		3.54		23.50	3.56	
Taught subject	biology and/or physical education	3.78		8.11		10.39		3.44		25.72	3.39	
	leading day-care	2.80	0.001*	6.60	0.040*	7.60	<0.001*	4.00	0.122	21.00	2.11	0.002*
	other	3.57		7.20		9.09		3.52		23.38	3.53	
	cumulative	3.55		7.27		9.15		3.54		23.50	3.56	
Time spent in teaching career	1–15 years	3.46		7.28		9.36		3.62		23.72	3.25	
	16–30 years	3.53		7.30		8.86		3.77		23.46	4.27	
	31–45 years	3.65	0.354	7.23	0.973	9.27	0.318	3.18	<0.001*	23.33	2.97	0.856
	cumulative	3.55		7.27		9.15		3.54		23.50	3.55	

* Significant values (significance was accepted at $p < 0.05$).**Table 3. Average pre- and post-measurement scores that teachers received during first aid training (n = 132)**

	Wound care	Treatment of unconscious child	Treatment of nosebleeds	Treatment of sprain/ dislocation/ fracture	Blood control	Total number
Pre-measurement	2.42	3.32	3.33	3.53	3.08	15.64
Post-measurement	3.71	6.11	5.3	6.54	5.71	24.68
p-values*	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$

* p-values were calculated using ANOVA.

Table 4. Comparison of the first-aid skills of teachers in relation to socio-demographic factors in pre-measurements ($n = 132$)

First-aid skills	Sociodemographic factor	Treatment of unconsciousness		Use of compression bandages		Wound care		Treatment of nosebleeds		Treatment of sprain/dislocation/fracture		Total	
		Average	p-value	Average	p-value	Average	p-value	Average	p-value	Average	p-value	SD	p-value
Gender	female	3.37		3.02		2.47		3.37		3.58		7.56	
	male	3.08	0.497	3.36	0.394	2.24	0.489	3.16	0.623	3.28	0.523	7.03	0.681
	cumulative	3.32		3.08		2.42		3.33		3.52		7.44	
Age group	20–35 years	3.11		3.00		2.17		3.67		3.44		5.86	
	36–50 years	3.39		3.10		2.50		3.36		3.81		7.97	
	over 50 years	3.31	0.869	3.10	0.978	2.42	0.703	3.17	0.620	3.21	0.319	7.36	0.791
	cumulative	3.32		3.08		2.42		3.33		3.52		7.44	
Type of settlement of school	village	4.09		3.36		2.70		3.76		3.91		7.78	
	city	3.19	0.021*	3.07	0.514	2.50	0.193	3.29	0.241	3.48	0.422	7.92	0.105
	county seat	2.89		2.88		2.10		3.02		3.27		6.10	
	cumulative	3.32		3.08		2.42		3.33		3.52		7.44	
Education	college/BA degree	3.23		2.96		2.37		3.29		3.56		7.35	
	university/MA degree	3.69	0.274	3.58	0.118	2.65	0.377	3.46	0.680	3.39	0.710	7.85	0.404
	cumulative	3.32		3.08		2.42		3.33		3.52		7.44	
Taught section	lower section	3.25		2.97		2.58		3.34		3.73		7.10	
	upper section	3.39	0.681	3.21	0.443	2.25	0.198	3.31	0.935	3.28	0.217	7.86	0.742
	cumulative	3.32		3.08		2.42		3.33		3.52		7.44	
Taught subject	biology and/or physical education	3.08		3.08		2.31		3.23		2.15		5.87	
	leading day-care	2.75	0.601	3.75	0.558	2.13	0.791	2.38	0.316	2.75	0.019*	6.61	0.459
	other	3.39		3.04		2.46		3.41		3.74		7.65	
	cumulative	3.32		3.08		2.42		3.33		3.52		7.44	
Time spent in teaching career	1–15 years	3.36		3.18		2.29		3.62		3.82		7.61	
	16–30 years	3.23	0.923	2.90	0.664	2.56	0.672	3.15	0.420	3.52	0.378	7.14	0.808
	31–45 years	3.39		3.21		2.41		3.21		3.18		5.86	
	cumulative	3.32		3.08		2.42		3.33		3.52		7.44	

* Significant values (significance was accepted at $p < 0.05$).

Table 5. Comparison of teachers' first-aid knowledge in relation to socio-demographic factors in post-measurements ($n = 132$)

First-aid skills	Sociodemographic factor	Treatment of unconsciousness		Use of compression bandages		Wound care		Treatment of nosebleeds		Treatment of sprain/dislocation/fracture		Total	
		Average	p-value	Average	p-value	Average	p-value	Average	p-value	Average	p-value	SD	p-value
Gender	female	6.12		5.68		3.79		5.39		5.75		26.74	
	male	6.08	0.912	5.80	0.741	3.36	0.113	4.92	0.250	5.20	0.236	25.36	0.288
	cumulative	6.11		5.71		3.71		5.30		5.64		26.48	
Age group	20–35 years	6.28		6.11		3.67		5.61		5.50		27.17	
	36–50 years	6.08		5.45		3.74		5.39		5.95		26.61	
	over 50 years	6.10	0.905	5.87	0.332	3.69	0.964	5.10	0.530	5.33	0.266	26.08	0.769
	cumulative	6.11		5.71		3.71		5.30		5.64		26.48	
Type of settlement of school	village	6.06		5.09		3.49		5.39		5.79		25.82	
	city	6.33		6.21		4.21		5.47		5.64		27.85	
	county seat	5.85	0.379	5.49	0.019*	3.20	<0.001*	5.00	0.445	5.54	0.876	25.07	0.048*
	cumulative	6.11		5.71		3.71		5.30		5.64		26.48	
Education	college/BA degree	5.92		5.55		3.67		5.24		5.61		25.98	
	university/MA degree	6.92	0.006*	6.35	0.059	3.89	0.428	5.58	0.400	5.77	0.733	28.50	0.047*
Taught section	cumulative	6.11		5.71		3.71		5.30		5.64		26.48	
	lower section	5.92		5.62		3.87		5.41		5.82		26.63	
	upper section	6.34	0.144	5.80	0.588	3.53	0.105	5.18	0.481	5.44	0.303	26.30	0.740
Taught subject	cumulative	6.11		5.71		3.71		5.30		5.64		26.48	
	biology and/or physical education	6.92		5.85		3.69		5.08		4.62		26.15	
	leading day-care	5.63		5.50		3.13		6.13		6.63		27.00	
	other	6.05	0.147	5.70	0.924	3.76	0.378	5.27	0.406	5.69	0.079	26.48	0.950
Time spent in teaching career	cumulative	6.11		5.71		3.71		5.30		5.64		26.48	
	1–15 years	6.36		5.87		3.82		5.71		6.09		27.84	
	16–30 years	5.73		5.35		3.63		4.98		5.42		25.10	
	31–45 years	6.31	0.137	5.95	0.286	3.69	0.740	5.23	0.154	5.41	0.209	26.59	0.074
	cumulative	6.11		5.71		3.71		5.30		5.64		26.48	

* Significant values (significance was accepted at $p < 0.05$).

There was a significant difference in the use of compression ($p = 0.019$), where teachers in the cities received 6.21 points (SD: 1.99), in the county seat 5.49 points (SD: 1.73), and in the village 5.09 points (SD: 1.89) (out of 9 points). Relating to wound care skills ($p < 0.001$), teachers in the cities achieved 4.21 points (SD: 1.17), village teachers 3.49 points (SD: 1.25), and county seat teachers 3.20 points (SD: 1.05) of the maximum 6 points. The average of the total scores gained also differed significantly ($p = 0.048$): city teachers achieved 27.85 points (SD: 5.69), village teachers 25.82 points (SD: 6.68), and county seat teachers 25.07 points (SD: 4.89) out of the maximum 41 points. As a result of the two-sample t -test, it became clear that teachers who graduated from university (6.92 points; SD: 2.10) showed a significantly better performance ($p = 0.006$) in relation to the treatment of an unconscious child, than those who were college educated (5.92 points; SD: 1.64). In addition, these teachers performed significantly better ($p = 0.047$) than college graduates (25.98 points; SD: 5.69) in relation to the average total score of post-measurements (28.50 points; SD: 5.99). The difference in skills of these two groups was not significant in the use of compression bandage ($p = 0.059$). A paired-sample t -test was performed to compare the pre- and post-assessment data. After the educational experiment, we found that teachers showed a significantly increased performance in all fields than before.

Discussion

The aim of our research was to become acquainted with the first aid knowledge, related experiences, attitudes, and skills of educators within the framework of an educational experiment, using a self-constructed questionnaire and measuring practical skills. Participants in the educational experiment achieved significantly better results after education on all topics taught than before ($p < 0.001$). Therefore, it can be stated that the educational experiment had a significant positive impact on the knowledge and skills of teachers. Arli and Yildirim (2017) obtained similar results in their research. The participants' first aid knowledge levels were assessed through a questionnaire administered as a pre-test. Following this, the experimental group were provided with theoretical and practical education on first aid. There was a significant difference between pre-test and post-test scores of the experimental group ($z = -4.215$, $p < 0.01$). Thus the basic first aid education given to the teachers increased their knowledge level.

The average first aid knowledge of teachers was 78.33%. This result concurs with previous domestic and international researches (Abelairas-Gomez et al., 2021; Alharbi et al., 2016; Masih et al., 2014). This relatively good result can be attributed to the fact that a significant proportion of teachers had previously received first aid training (123 people, 78.85%). Another supporting factor is the motivation and interest of teachers; 100% consider first aid training to be an important element of academic teacher education, and 87.2% would take part in a free first aid course if given the opportunity. In our study, 84.62% of the teachers participated in the education we hold. When it came to practical skills, the average performance of teachers was 38.15% in relation to the optimal level we set. This also correlates with the skill level of other lay groups, according to the literature testimony. In a prior study (Gyócsi and Deutsch (2014), the skill performance of lay parents were lower than the teachers in our study, with an average score of 14.8 points out of 48 points (30.83%).

In the research of Alharbi et al. (2016), analysed teachers provided nearly the same (38.9%) performance in Saudi Arabia as our results.

Teachers need a higher levels of preparedness, because there are a lot of accidents at the schools. This was supported by the results of our own research regarding the frequency of school accidents. The possible reasons of the low level of performance can be the following: the lack of practice opportunities in a simulated situation, stress resulting from uncertainty, and previous practical training for most of the teachers has mainly been limited to the implementation of the recovery position and BLS. An additional problem could be that the prior first aid knowledge and skills of the laypersons was not related to the specialties of childcare but the adult care. In the research of Olmos-Gómez et al. (2021), the authors indicate that although teachers are aware of the importance of first aid for their professional development, there is no such training in their careers. Thus they have great difficulty understanding how to react to emergency situations on the job.

Another important result of the research is that there is no close correlation between the theoretical knowledge and practical skills of teachers in several treatments. For example, teachers knew how to fix sprained limbs, but could not perform this properly, thereby causing additional pain to the child. Parents knew the contraindications of the recovery position, but they were not able to find them during the practical scenario. The cause of this could be that the theories of the former first aid training of teachers had been more emphasized than practice, or in the absence of sufficient training, the necessary skills had not been developed or may had been incorrectly fixed. The research of Galindo Neto et al. (2018) covered experiences based on popular beliefs, family experiences and knowledge gaps.

Booster trainings are also necessary because of refreshing knowledge and skills, and to follow the new guidelines. One of the expected results of the research was that biology and physical education teachers would be the most prepared for first aid training, in terms of both theoretical knowledge and practical skills. However, they performed only better in the theoretical test. Practical skills were performed better by the teachers of other subjects.. So, regardless of the relatively good level of knowledge, uncertain or unprofessional care may also be frequent. For this reason, another analysis of underlying causes should be undertaken in the future. The limitations of our research were the lack of experimental studies about the importance of teachers first aid knowledge, the low number of participants, and the lack of time of teachers for participation. These limits can be overcome by increasing the size of the sample and involving more educators.

Conclusions

In summary, teachers are sufficiently motivated to acquire first aid, both theoretically and practically. However, the results of the simulated assessments show that it is important to involve first aid training in teachers' education, especially related to the special needs of childcare. The results also demonstrated that practical training would be necessary to improve skills. During the practice, the effectiveness would be improved using scenarios, simulations, role games, as well as the involvement of imitators/actors during the demonstration and the use of video tutorials. Therefore, continuous first aid training in schools for teachers would be essential, provided by experi-

enced health care professionals or previously trained teachers to save more lives and avoid bad outcomes after accidents and illnesses.

Ethical aspects and conflict of interests

The authors have no conflict of interests to declare.

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Authors' contributions

KD: Conceptualisation, methodology, investigation, project administration, scientific support. IJ: Conceptualisation, investigation, software, data curation. HBSC: Resources, visualisation. LAF: Resources, visualisation. OM: Writing original draft, English editing. JB: Conceptualisation, validation, scientific support. BB: Supervision, project administration, scientific support.

Znalosti a dovednosti učitelů základních škol v Maďarsku v oblasti první pomoci

Souhrn

Cíl: Cílem výzkumu bylo změřit znalosti, zkušenosti, postoje a dovednosti učitelů v oblasti první pomoci v rámci vzdělávacího experimentu.

Metody: Cílovou skupinou byli učitelé působící na základních školách v okrese Baranya v Maďarsku. Studie, jejíž součástí byl vlastní dotazník, se zúčastnilo celkem 156 učitelů ($N = 156$); 132 učitelů ($n = 132$) se také zúčastnilo školení první pomoci. Statistická analýza byla provedena pomocí deskriptivní statistiky, jedno/dvouparového T -testu a ANOVA. P -hodnota menší než 0,05 byla považována za statisticky významnou.

Výsledky: V průměru dosáhli pedagogové výsledku 78,33 % v hodnocení znalostí první pomoci, ale jen 38,15 % u praktických dovedností. Na základě výsledků došlo v průběhu jednoho akademického roku k několika úrazům ve školách ve městech (672) a na nižším stupni (498). Účastníci dosáhli po edukaci výrazně lepších výsledků ve všech vyučovaných tématech než dříve ($p < 0,001$). **Závěr:** Úroveň znalostí první pomoci je mezi učiteli přiměřená, ale v mnoha případech to neodpovídá jejich praktickým dovednostem. Velký počet školních úrazů však vyžaduje kompetentní učitele. Vzdělávací experiment měl výrazně pozitivní dopad na znalosti a dovednosti pedagogů. To ospravedlňuje motivaci učitelů a jejich schopnost zvládnout odbornou péči.

Klíčová slova: dovednosti v oblasti první pomoci; školení v oblasti první pomoci; učitelé; znalost první pomoci

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