

## Educational intervention on first aid for kindergarten teachers: quasi-experimental study

*Intervenção educativa para professores de creches sobre primeiros socorros: estudo quase-experimental*  
*Intervención educativa para docentes de guarderías sobre primeros auxilios: un estudio cuasi-experimental*

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### Abstract

**Objective:** To test an educational intervention for kindergarten teachers on first aid, regarding the outcomes of knowledge and skill. **Methods:** Quasi-experimental study of the before and after type, carried out in ten public municipal kindergarten centers in Piauí, during September to October 2019. The sample consisted of 36 teachers and data collection was carried out in three stages: pre-test on knowledge and skills in first aid; application of theoretical-practical educational activity; and post-test. Data were analyzed using the Wilcoxon test. **Results:** 97.2% were female, the average age was 41.47 ( $\pm$  9.48) years, 86.1% were only graduates and 13.9% had graduate degrees. 97.2% did not take a first aid course and 58.3% had already witnessed some need for this type of care. Participants showed an increase in knowledge after the intervention in the following items: emergency response ( $p=0.000$ ); detection and management of cardiorespiratory arrest ( $p=0.000$ ;  $p=0.002$ ); and management of bleeding ( $p=0.001$ ). The technical ability of professionals showed an increase in all stages of care in victims of cardiorespiratory arrest with  $p<0.05$  in all items evaluated. **Conclusion:** After the intervention, there was an increase in teachers' knowledge and skill about first aid situations.

**Descriptors:** First aid; Health Education; School Teachers; Teacher Training.

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### Whats is already known on this?

First aid should be incorporated as an indispensable theme in the training of kindergarten teachers to improve initial care in accidents in the preschool environment.

### What this study adds?

An intervention carried out in a group, through lectures and practical training stations, can be a strategy to increase teachers' knowledge and skills about first aid.



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### Resumo

**Objetivo:** testar uma intervenção educativa para professores de creche sobre primeiros socorros, quanto aos desfechos de conhecimento e habilidade. **Métodos:** estudo quase-experimental do tipo antes e depois, realizado em dez creches municipais públicas no Piauí, no período de setembro a outubro de 2019. A amostra foi composta de 36 professores e a coleta de dados foi realizada em três etapas: pré-teste acerca do conhecimento e habilidades em primeiros socorros; aplicação de atividade educativa teórico-prática; e pós-teste. Os dados foram analisados a partir do teste de Wilcoxon. **Resultados:** 97,2% são do sexo feminino, a média de idade é de 41,47 ( $\pm 9,48$ ) anos, 86,1% são apenas graduados e 13,9% têm pós-graduação. Ademais, 97,2% não realizaram curso de primeiros socorros e 58,3% já haviam presenciado alguma necessidade desse tipo de atendimento. Os participantes apresentaram aumento do conhecimento após a intervenção nos seguintes itens: acionamento de socorro ( $p=0,000$ ); detecção e conduta na parada cardiorrespiratória ( $p=0,000$ ;  $p=0,002$ ); e conduta em hemorragias ( $p=0,001$ ). A habilidade técnica dos profissionais apresentou aumento em todos os passos do atendimento em vítimas de parada cardiorrespiratória com  $p<0,05$  na totalidade de itens avaliados. **Conclusão:** após a intervenção, observou-se aumento do conhecimento e habilidade dos professores sobre situações de primeiros socorros..

**Descritores:** Primeiros Socorros; Educação em Saúde; Professores Escolares; Capacitação de Professores.

### Resumen

**Objetivo:** Probar una intervención educativa para docentes de guarderías sobre primeros auxilios, en cuanto a resultados de conocimientos y habilidades. **Métodos:** Estudio cuasi-experimental de antes y después, realizado en diez guarderías públicas municipales de Piauí, de septiembre a octubre de 2019. La muestra estuvo compuesta por 36 docentes y la recolección de datos se realizó en tres etapas: pre-test sobre conocimientos y habilidades en primeros auxilios; aplicación de la actividad educativa teórico-práctica; y post-test. Los datos se analizaron mediante la prueba de Wilcoxon. **Resultados:** el 97,2% eran mujeres, la edad promedio era de 41,47 ( $\pm 9,48$ ) años, el 86,1% eran solo graduados y el 13,9% tenían posgrado. El 97,2% no había realizado curso de primeros auxilios y el 58,3% ya había presenciado alguna necesidad de este tipo de atención. Los participantes mostraron aumento de conocimiento después de la intervención en los ítems: activación de la ayuda ( $p=0,000$ ); detección y manejo en paro cardíaco ( $p=0,000$ ;  $p=0,002$ ); y manejo de hemorragias ( $p=0,001$ ). La habilidad técnica de los profesionales mostró un aumento en todos los pasos de la atención a las víctimas de parada cardíaca, con  $p<0,05$  en todos los ítems evaluados. **Conclusión:** Después de la intervención, se observó un aumento en los conocimientos y habilidades de los docentes con respecto a las situaciones de primeros auxilios.

**Descriptor:** Primeros auxilios; Educación para la salud; Maestros de escuela; Formación de profesores.

## INTRODUCTION

According to the current Brazilian Federal Constitution, the State is responsible for guaranteeing early childhood education, in kindergartens and preschools, to children up to five years of age.<sup>(1)</sup> Accordingly, the Statute of the Child and Adolescent (SCA) through law 8.069 of 1990 guarantees the child its full protection, emphasizing the priority of receiving protection and assistance in any circumstances, including in the formal educational environment.<sup>(2)</sup>

In kindergarten centers, children develop various activities ranging from teaching to recreation and socialization with play, which expose them to greater risk of accidents, since the typical profile of restlessness, imponderable behavior and natural curiosity associated with physical and mental immaturity contribute to lower risk perception and greater vulnerability, making them dependent on third parties in terms of safety. Thus, first aid measures need to be implemented in the school environment in order to reduce complications arising from urgent and emergency situations.<sup>(3,4)</sup>

More recently, as a result of the fatal exposure of a child to airway obstruction by a foreign body during his stay in school activities, Law 13,722 of October 4, 2018,<sup>(5)</sup> was implemented, which instituted the mandatory training in first aid basics for teachers and employees of public and private institutions of basic education and child recreation.

Data indicate that Brazil has a high number of accidents, which are the main cause of death among children in the range of 1 to 14 years, and in kindergartens and preschools, between the age group of 0 to 6 years of age these occurrences stand out.<sup>(6)</sup> This finding strengthens the imminent need for actions that materialize the indispensable teacher training in First Aid (FA) and the inclusion of this theme in the pedagogical project of early childhood education.

Although some strategies for teaching FA to teachers have already been reported in the literature, it is noted that the literary contribution related to this theme is mostly characterized by works that report interventionist experiences or evaluate the knowledge of teachers without performing some type of training.<sup>(7,8)</sup> Thus, there is a gap with regard to the results arising from educational proposals with the evaluation of knowledge and skill before and after the intervention.

In view of the above, the question is: does the realization of the group educational activity on first aid favor the knowledge and application of the technical skills of kindergarten teachers in child care?

In view of the need to safeguard the integrity of children, it is justified to carry out the research as an indispensable resource for first aid training with kindergarten teachers, as the vulnerability to accidents in this age group is known. And, first aid actions must be carried out effectively and safely, in order to avoid sequelae and increase the chance of survival until the arrival of a specialized team.

Thus, the objective was to test an educational intervention for kindergarten teachers about first aid, regarding the outcomes of knowledge and skill.

## METHODS

This is a quasi-experimental study of the before and after type, with a quantitative approach. The research was developed in public municipal kindergarten centers, located in the urban and rural area in the municipality of Picos-Piauí. According to census data from the Municipal Department of Education, in Picos-Piauí, there are 10 kindergarten centers, which offer only early childhood education, seven in the urban area and three in the rural area and serve a total of 1,070 children, ranging from: maternal two years, maternal three years, garden I or Preschool I (four years) and garden II or preschool II (five years).

The research population corresponded to 102 teachers of early childhood education. The inclusion criterion was defined as: being a teacher of early childhood education in municipal kindergarten centers in the city of Picos-Piauí. As exclusion criteria: withdrawal at any stage of the study or professionals on leave or vacation. Thus, the sample consisted of 36 teachers, since in the last stage of the research 66 were on vacation and did not attend.

Data collection took place from September to October 2019, being carried out in three stages, divided into pre-testing, application of educational intervention (workshop) and, finally, post-testing.

**1<sup>st</sup> Stage - Pre-test:** To carry out the first stage, the researchers contacted the coordinators of early childhood education and invited the teachers to participate in the research. A meeting was scheduled for professionals from both the urban and rural areas to sign the Informed Consent Form and complete the structured pre-test questionnaire prepared by the researchers, which underwent a prior content validation, considering the criteria of objective, structure and relevance, with four specialists from the Mobile Emergency Care Service (SAMU) and consisted of the use of concepts and techniques in first aid applied to children when they are victims of Foreign Body Airway Obstruction (FBAO), Cardiopulmonary Arrest (CPA) and musculoskeletal trauma. These themes were chosen based on the empirical experience of one of the researchers during her pre-hospital care routine, and the time to complete the questionnaire was 20 minutes. Next, a practical simulation was carried out in a group with the same subjects addressed in the questionnaire, in order to testify to the technical ability of the professionals. The researchers read fictitious cases involving the need for first aid care by teachers, and they should perform the care they considered to be correct. An observation script was used in which, through non-participant observation, the observer-researcher verified the conformities and nonconformities of the care provided by the members of the sample group. For practical simulation, the following materials were used: torso simulator doll for cardiopulmonary resuscitation with adult and child selector; moldable orthopedic immobilization splints and cardboard immobilization splints; Cremer 23cm X25cm non-sterile surgical field compresses; 13 wire gas compresses; elastic crepe bandages 15cm X 1.80cm; physiological solution 0.9% 500 ml; and waterproof adhesive;

**2<sup>nd</sup> Stage - Application of the educational activity:** immediately after the completion of the 1st stage, the first aid educational activity followed, of the workshop type with a theoretical-practical approach, which was applied with the teachers. For this, a pedagogical script was developed for the application of these activities, which was created by the authors, containing the description of the topics: theme, objective, material resources, program content, teaching-learning method and evaluation. Such actions were given by instructors trained in Basic Life Support and pre-hospital care, and used the same materials of the first stage;

**3<sup>rd</sup> Stage - Post-test:** This stage occurred thirty days after the second stage for the reapplication of the same questionnaire that was initially used as a pre-test, with a change only in the positioning of the questions, in order to avoid the bias of remembering the correct answers previously marked, as well as the completion of the observation script by the same observer-researcher of the first stage, thus allowing to evaluate data regarding the knowledge and technical skill acquired by kindergarten teachers after receiving the instructions of the educational activity.

The data were organized into tables, analyzed and processed using the IBM-Statistics Statistical Package for the Social Science (SPSS) software version 23.0, where the frequency, measures of central

tendency and dispersion were calculated to describe the descriptive variables, in addition to the Wilcoxon test, considering statistical significance when  $p < 0.05$ .

The research was approved by the Research Ethics Committee (REC) of the Federal University of Piauí (UFPI) through the REC's consolidated opinion: 3.579.35

## RESULTS

As shown in Table 1, it was found that in the sample 25 (69.4%) are married, 35 (97.2%) female, with a mean age of 41.47 ( $\pm 9.48$ ) years old. 31 (86.1%) have only graduation, highlighting the pedagogy training 12 (33.3%).

**Table 1.** Presentation of socio-professional data of teachers. Picos, Piauí, Brazil, 2019.

Variables	n	%
<b>Marital Status</b>		
Married/common-law married	25	69.4
Single	7	19.4
Widowed	2	5.6
Divorced	2	5.6
<b>Sex</b>		
Female	35	97.2
Male	1	2.8
<b>Education Level</b>		
Graduation	31	86.1
Post-graduation Lato Sensu	5	13.9

Source: Study data.

The data presented in Table 2 refer to previous training in first aid. The study found that 35 (97.2%) of the teachers did not take a first aid course prior to the educational activity. Asked about the need for care 21 (58.3%) stated that the most attended cases were: cut with bleeding and falls, both with the same percentage 15 (71.4%). However, only 15 (41.7%) had already performed some type of care and procedures in children victims of falls 13 (86.7%) in the school environment. It is also evident that only five (13.9%) feel fit and safe to perform first aid procedures.

**Table 2.** Presentation of data regarding previous training and care in first aid. Picos, Piauí, Brazil, 2019.

Variables	n	%
<b>Did you take a first aid course?</b>		
No	35	97.2
Yes	1	2.8
<b>Did you see the need for first aid in the kindergarten center?</b>		
Yes	21	58.3
No	15	41.7
<b>Witnessed Cases*</b>		
Cut with Bleeding	15	71.4
Fall	15	71.4
choking	4	19.0
Fracture	3	14.3
fainting	2	9.5
convulsion	1	4.8
Drowning	1	4.8
<b>Did you provide first aid to the child at the kindergarten center?</b>		
No	21	58.3
Yes	15	41.7
<b>Cases assisted*</b>		
Fall	13	86.7
Cut with bleeding	10	66.7
Choking	3	20.0
Fracture	2	13.3
Fainting	1	6.7

Convulsion	1	6.7
<b>Do you feel safe and able to provide first aid to a child?</b>		
No	31	86.1
Yes	5	13.9

Source: Study data.

\*In this variable more than one answer was possible.

Table 3 shows the theoretical knowledge from the sequence of correct answers that deals with first aid care procedures in children. Of the nine items evaluated, five were found to be statistically significant.

An increase in theoretical knowledge was identified in items 2 to 9 with emphasis on item 6, from eight (22.2%) to 29 (80.6%) correct answers after the intervention. Statistical significance was verified with  $p < 0.05$  in items 1, 5, 6, 7 and 9.

**Table 3.** Data on the evaluation of the theoretical knowledge of the research participants. Picos, Piauí, Brazil, 2019.

Questionnaire item	Pre-test n (%)	Post-test n (%)	$p^*$
Item 01: Call the rescue service	36 (100%)	36 (100%)	0.000
Item 02: SAMU Contact	14 (38.9%)	28 (77.8%)	0.403
Item 03: Contact the fire department	32 (88.9%)	35 (97.2%)	0.357
Item 04: Foreign body airway obstruction	30 (83.3%)	36 (100%)	0.317
Item 05: CRA Detection	8 (22.2%)	29 (80.6%)	0.000
Item 06: Initial action in CRA	21 (58.3%)	35 (97.2%)	0.002
Item 07: Initial action in musculoskeletal trauma	11 (30.6%)	30 (83.3%)	0.477
Item 08: Action for containment and hemorrhage	25 (69.4%)	33 (91.7%)	0.001

Source: Study data.

\* Wilcoxon test

In Table 4, the technical skill is evaluated from a simulation performed before and after the application of the educational activity. Among the three cases presented, although the number of correct answers in the execution of technical skills increased in the second moment in relation to the first, only in CPR all items had statistical significance with  $p < 0.05$ .

**Table 4.** Data on the evaluation of the technical ability of teachers. Picos, Piauí, Brazil, 2019.

Observation Script Item	Pre-test n (%)	Post-test n (%)	$p$	
<b>FBAO</b>	Stage 1: Knee behind the victim	-	33 (91.7%)	0.000
	Stage 2: Heimlich maneuver	-	29 (80.6%)	0.000
	Stage 3: Call 192	27 (75%)	32 (88.9%)	0.132
	Stage 4: Check for return of breath, chest expansion, crying and pink skin	3 (8.3%)	28 (77.8%)	0.000
<b>CPR</b>	Stage 1: Check the victim's level of consciousness, responsiveness.	-	17 (47.2%)	0.000
	Stage 2: Check carotid pulse.	-	32 (88.9%)	0.000
	Stage 3: Expose the chest and check for absence of breathing	-	22 (61.1%)	0.000
	Stage 4: Chest compression.	-	36 (100%)	0.000
	Stage 5: Call 192	30 (83.3%)	36 (100%)	0.014
	Stage 6: Request automatic external defibrillator	-	28 (77.8%)	0.000
<b>TRAUMA</b>	Stage 1: Hold affected limb with both hands, one joint above and one joint below the injury	-	20 (55.6%)	0.000
	Stage 2: Request help to immobilize the affected limb	-	26 (72.2%)	0.000
	Stage 3: Immobilize with a cardboard splint on the palm of the hand, wrapping with a bandage, from the distal to the proximal part, one joint above and the other below the injury.	-	32 (88.9%)	0.000



Stage 4: Call 192	30 (83.3%)	33 (91.7%)	0.317
Stage 5: Keep the child immobile at the place of the fall	-	33 (91.7%)	0.000

Source: Study data

\*Wilcoxon test

## DISCUSSION

The teaching profile found in the research reveals that most of them are women with an average age of 41.4 years, married, with undergraduate education. Similar data were found in a study carried out with elementary school teachers, where it was found that the majority were female, aged between 23 and 56 years and with complete higher education.<sup>(9)</sup>

According to the INEP portal, in Brazilian basic education, teacher education is constituted by about 80% of the female public, and of these, more than half are 40 years of age or older.<sup>(10)</sup> After women achieved the right of higher teaching, they still suffered stigmas about their professions, since they should, for society, focus on feminized professions that are often related to the extinct mother and the act of caring.<sup>(11)</sup>

Regarding the data related to training in first aid, and having witnessed the need for care, similar data were found in a study conducted with teachers from public and private schools in Belo Horizonte,<sup>(12)</sup> where it was noted that most teachers were not trained in relation to first aid care, many of them reported having gone through some emergency situation in the school environment, among them: seizure (60.4%) and the care indicated during abundant bleeding (47.9%).

In congruence with these data, a study conducted with children, parents and teachers of a kindergarten center reports that the main accidents that occurred in childhood include falls, burns, cuts, drownings and poisoning. As a way to reduce risks and improve behaviors in the first care, the suggested indication is to train teachers and other employees of the educational sector to act in these situations, making the child who needs this care receive it early.<sup>(13)</sup>

Some studies present the gaps in the knowledge and aptitude of teachers to deal with situations of health problems in teaching environments.<sup>(7,14)</sup> The findings indicate that a portion of teachers feel partially prepared for simple situations, holding theoretical knowledge, but training is weak and they do not feel confident to provide assistance in more aggravating situations such as dislocations and convulsive crises.

Faced with a situation of urgency and emergency, sometimes due to pressure from the teacher's responsibility or even due to fear of omission of help, care is based on beliefs established in popular myths. These attitudes based on informal dialogues added to the lack of scientific knowledge and lack of professional preparation, given the situation, can generate a worsening in the situation and/or hinder the provision of help.<sup>(3)</sup>

Among the strategies to promote permanent education and first aid training, a research<sup>(15)</sup> applied a short course and evaluated 35 teachers, with experiment before and after, in order to verify the theoretical/practical knowledge about first aid. This research obtained in its results, before training, an average score of 19.43 points referring to technical skill and an average of 2.91 points referring to theoretical knowledge, and, after training, the average in skill was 174.57 points and in knowledge 9.17 points, showing significant improvement after the intervention ( $p < 0.001$ ).

Another study<sup>(16)</sup> described the realization of a training on first aid with teachers and kindergarten assistants, with the strategy of exchanging theoretical knowledge and experiences already lived. As a result, it showed an improvement in the knowledge of teachers and kindergarten assistants in relation to the first care that must be provided in the face of a victim of any incident involving the physical or mental state of students attending school.

Evaluated on the technical skills of teachers through 3 hypothetical simulated cases (FBAO, CPR and trauma) it was observed that there was improvement in responses in all stages to be followed.

In a study conducted to assess the effectiveness of an intervention, teacher performance was above 90% immediately after the practical theoretical course.<sup>(17)</sup> Another study was conducted with two groups, the control group and the experimental group, where the same questionnaire was applied pre and post-intervention with both groups, however, only the experimental group received the intervention, in the result observed a positive improvement in the level of knowledge of the experimental group where ( $P < 0.001$ ), in contrast, the control group that did not receive intervention, there was no significant difference (being the value of  $p = 0.114$ ).

The publication of an experience report <sup>(18)</sup> of educational workshops with themes of falls, choking, seizures and allergies, which was carried out with 64 professionals linked to the direct and daily care of children, resulted in a transformation of the child care after this health education activity.

The research had the following limitations: the impossibility of expanding the application of the results to other levels of education (preschool or elementary school), as well as with the other employees of kindergarten centers, since the research had been carried out only with teachers; and the inclusion of teachers with previous training in the theme of FA, which may have affected the measure of the expected effect. However, despite this, the study contributes to emphasize the relevance of Law number 13.722/18,<sup>(5)</sup> and to propose a planned, systematized, easy-to-apply and low-cost educational strategy that can be inserted in the teaching training schedule in kindergarten centers, in addition to allowing the intersectorality between the education and health sector.

## CONCLUSION

It is concluded that, after the intervention, there was an increase in the knowledge and skill of kindergarten teachers about first aid situations. Therefore, this activity can be an option to be included as a resource for continuing education in school pedagogical projects. It is also recommended that a randomized controlled trial be conducted a posteriori to test the efficacy or effectiveness of the intervention.

## CONTRIBUTIONS

Contributed to the conception or design of the study/research: Silva MMP, Pereira FGF. Contributed to data collection: Silva MMP, Pereira FGF. Contributed to the analysis and/or interpretation of data: Silva MMP, Pereira FGF. Contributed to article writing or critical review: Carvalho REFL, Caetano JÁ, Pereira FGF, Silva ICEC, Holanda MM. Final approval of the version to be published: Silva MMP, Carvalho REFL, Caetano JÁ, Pereira FGF, Silva ICEC, Holanda MM.

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