



SCIENTIFIC LETTERS

One hundred eighty days maintenance of information in basic life support training in primary education in a rural environment[☆]



180 días de mantenimiento de la Información en Formación de Soporte Vital Básico en Educación Primaria en un Entorno Rural

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Out-of-hospital cardiopulmonary arrest is one of the leading causes of death worldwide, its survival rates ranging from 2% to 20%.^{1,2}

The most effective prevention of cells death is the early restoration of oxygen supply through basic life support (BLS) in the form of cardiopulmonary resuscitation (CPR) with eventual defibrillation.²

According to the "Kids Save Lives" declaration on CPR education approved by the World Health Organization, "teaching CPR to all students will lead to a marked improvement in global health".³

The aim of this study was to train elementary school students in BLS in the event of adult CPR and to assess their knowledge of the subject before the training session and the acquisition and maintenance of knowledge seven days and 180 days afterwards.

A six-month longitudinal cohort study was carried out between September 2023 and April 2024 on children aged between five and twelve from three elementary school in a rural setting.

An interactive learning and training session on the topic was held, based on the 2021 ERC Resuscitation Guidelines,⁴ adapted to these ages, lasting 90 min, by two Family Medicine doctors, the same supporting presentation being used for all sessions in three different schools who accepted the invitation to participate. Pupils were only included after parent's written authorization. A questionnaire was administered before the sessions and 7 days and 180 days afterwards.

The questionnaire was adapted and validated after authorization from the original authors.³

Statistical analysis was made using SPSS v27, with non-parametric descriptive and inferential statistics. The study received a positive opinion from the Ethics Committee of the Centro Regional Health Administration.

One hundred seventy-three students took part in the study, with an average age of 7.7 ± 1.2 years, 92 (53.2%) being male.

The average number of correct answers in the first assessment was 3.7 ± 1.3 , 7 days later it was 6.7 ± 1.8 and

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Table 1 Sample characterization and results.

| | 1st evaluation (n = 173) | 2nd evaluation (n = 173) | 3rd evaluation (n = 160) | p-Value | |
|--------------------------------|-----------------------------|-----------------------------|-----------------------------|--------------------|---------------------|
| <i>Participants by gender</i> | | | | | |
| Male | 92 (53.2%) | 92 (53.2%) | 83 (51.9%) | 0.963 ^a | |
| Female | 81 (46.8%) | 81 (46.8%) | 77 (48.1%) | | |
| <i>Participants by grade</i> | | | | | |
| 1st grade | 27 (15.6%) | 27 (15.6%) | 27 (16.9%) | 0.972 ^b | |
| 2nd grade | 48 (27.7%) | 48 (27.7%) | 43 (26.9%) | | |
| 3rd grade | 50 (28.9%) | 50 (28.9%) | 47 (29.4%) | | |
| 4th grade | 48 (27.7%) | 48 (27.7%) | 43 (26.9%) | | |
| <i>Average score by grade</i> | | | | | |
| 1st grade | 3.1 ± 1.5 Median 3 | 6.4 ± 2.1 Median 7 | 4.9 ± 1.6 Median 5 | 0.002 ^b | |
| 2nd grade | 3.9 ± 1.2 Median 4 | 6.3 ± 1.6 Median 6 | 4.9 ± 1.6 Median 5 | | |
| 3rd grade | 3.7 ± 1.3 Median 3.5 | 6.8 ± 1.8 Median 7 | 6.6 ± 1.4 Median 7 | | |
| 4th grade | 3.7 ± 1.3 Median 3.5 | 7.3 ± 1.6 Median 8 | 6.5 ± 1.7 Median 6 | | |
| <i>Average score by gender</i> | | | | | |
| Male | 3.7 ± 1.3 Median 4 | 5.9 ± 1.6 Median 6 | 5.9 ± 1.7 Median 6 | | |
| Female | 3.7 ± 1.2 Median 4 | 6.3 ± 1.7 Median 6 | 6.3 ± 1.7 Median 6 | | |
| <i>Average score</i> | 3.7 ± 1.3 | 6.7 ± 1.78 | 6.1 ± 1.7 | | <0.001 ^b |

^a Mann-Whitney *U* test.^b Kruskal-Wallis test.

180 later it was 6.1 ± 1.7 (Table 1), significantly different between the assessments ($p < 0.001$).

By school grade, significant differences were found in the 2nd and 3rd assessments ($p = 0.040$ and $p < 0.001$, respectively), students in more advanced classes obtaining better results.

By gender, significant differences were only found in the 2nd assessment ($p = 0.016$), females showing better results than males (6.3 ± 1.7 and 5.9 ± 1.6 , respectively).

There were positive trends in the correct answers to all the questions from the first to the second assessment ($\Delta = +0.82$). Between the second and third assessments negative trends ($\Delta = -0.10$) were found for questions 1, 4, 6, 7, 8 and 10, still positives trends ($\Delta = +0.65$) were found considering all questions from the first to the third assessment.

These results show that in the long term the children's level of knowledge remained very satisfactory compared to what they had before the session and seem to show that the learning and practicing organization of the session was adequate.

This maintenance of knowledge over time corroborates the results of other studies with similar objectives.^{3,5,6} However, the evidence that the retention of knowledge decreases over time,³ demonstrates the need for regular updating of knowledge, the periodicity for its realization being a matter of debate, to which future studies may respond. Girls and those in more advanced years achieved significant better results.

One point that differentiates this study from the others is the fact that the training session was carried out by doctors as trainers, thus avoiding a confounding human factor.

In conclusion, the theoretical-practical action on BLS carried out by the same trainers improved the results of a questionnaire specifically developed and validated when comparing the results of its application prior to the course and in two other applications, seven days and 180 days after the course.

Ethical considerations

The study received a positive opinion from the Ethics Committee of the Regional Health Administration of the Centre (Projeto 94/2022, October 2022). The positive opinion of the schools that received the initiative was obtained. The children participated in this study voluntarily and each child was informed that they could leave at any time, without constraint for them. Before the start of the study, parents gave their written consent.

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Conflict of interest

The authors of this article declare that they have no conflict of interest in relation to this research.

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