“Dare to save a life at school”: implementation of a basic life support cycle in the PE curriculum

Alexandre Mouton, Charlotte Laurent, Manon Collin, Simon Verdonck, Damien Ovart, Denis Ulweling & Marc Cloes

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In Europe and the U.S., at least 700,000 people die each year following sudden cardiac death.

2000 death/day → Third common killer after cancer and other cardiovascular diseases

Survival rate: 5 to 10%

+ Bystander cardiopulmonary resuscitation (CPR) X 2 - 4

+ Early defibrillation X 5 - 7

Berdowski et al., 2010

ERC (2015)
Out-of-hospital cardiac arrest is witnessed in 60–80% 

Holmberg et al., 2000

But less than 20% of people can react appropriately

Plant & Taylor, 2013

Recommended to learn CPR at school to increase survival rate

Bottiger & Van Aken (2015)
Trained teachers can provide adequate resuscitation training in schools (Lukas et al. 2016)

Physical education (PE) teachers are recommended to incorporate resuscitation training in their curriculum (Colquhoun, 2012)

Schoolchildren serve as multipliers: at home they teach their brothers and sisters, their parents, their grandparents and many others in their families (Bottiger & Van Aken, 2015)

PE would contribute in shaping individuals anchored in their society, meeting physical literacy and accountability objectives (Whitehead, 2013)

Examine the feasibility, the relevance and the impact on knowledge and practical skills of the implementation of a basic life support cycle in the PE curriculum.
1. Context

- One secondary school in the center of Liège (Belgium)

- 44 female students (17,15±0,36 y) in their last year of secondary school

- One female PE teacher (26 y) holder of a Master in PE and of an aquatic lifesaving degree
Program development

✓ Collaboration between the *Francophone Belgian Lifesaving Association (LFBS)* and the *University of Liege*

✓ One day training of the PE teacher by a BLS instructor from the LFBS

Active participation of the PE teacher in the creation of the BLS cycle

Equipment

- Little Anne (x4)
- Pocket Mask (x4)
- AED (x2)
Program: 6 PE classes of 50-minutes

Class 1
- Information about the cycle
- Initial knowledge assessment (19 items questionnaire)

Class 2
- Where are hands placed for chest compression?

Class 3
- Sharing of BLS experiences (training and real-life)
- Questions-answers

Class 4

Class 5

Class 6
- Where are electrodes placed for defibrillation?
3 Program: 6 PE classes of 50-minutes

- Class 1
  - Training of BLS without equipment
  - 2x3 workshops

- Class 2
  - Frequency of compressions (100-120/min)

- Class 3
  - Resistance training (2min)
  - Check victim status and call for help

THE SURVIVAL CHAIN
Program: 6 PE classes of 50-minutes

- Discover and insufflate with the pocket mask
- 2-Person CPR training

Class 1

- Rescuer 1
  - Consciousness
  - Breathing (VES 10’’)
  - Compressions/insufflations 30/2
  - Insufflations (2)
  - Compressions (30)

Class 2

- Rescuer 2
  - Security
  - Call 112
  - Defibrillation
  - Shock 1
  - Compressions (30)
  - Shock 2
  - Insufflations (2)
Program: 6 PE classes of 50-minutes

- Class 1
  - Discover the DEA (training DEA + where to find it?)
  - Training of the BLS protocol with the DEA

- Class 2

- Class 3

- Class 4

- Class 5

- Class 6
Program: 6 PE classes of 50-minutes

- Class 1: Five workshops to prepare the assessment
- Class 2: Simulated assessment X 2
- Class 3: Resistance training (2min), 2-Person CPR training
- Class 4: Video (real-life CPR+DEA)
- Class 5: 
- Class 6: 

https://youtu.be/3ZXZUoB7GU8
Program: 6 PE classes of 50-minutes

Class 1
- Final knowledge assessment (19 items questionnaire)
- Practical assessment: 1-Person BLS+AED

Class 2
- Assessed by the PE teacher + external instructor

Class 3
- 16 items evaluation grid
- Questions about the feasibility and the relevance of the BLS cycle

Class 4

Class 5

Class 6
Results
1 Pre-Post Intervention comparison

✓ Scores on Questionnaire (/20; n=44)

<table>
<thead>
<tr>
<th>Pre-intervention</th>
<th>Post-intervention</th>
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<tbody>
<tr>
<td>6,12 ± 3,25 [1-14]</td>
<td>17,32 ± 1,79 [10,5-20]</td>
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Significant improvement ($p<0,00$)
1 Pre-Post Intervention comparison

✓ Scores on practical test (hands-on CPR; /20)

17.16 ± 1.72
[13.6-20]
Feasibility and relevance

✓ «Today, you feel able to provide first aid to a cardiac arrest people»

Before and after comparison of responses:
- **Totally agree**
- **Agree**
- **Disagree**
- **Totally disagree**

Before:
- 0% Totally agree
- 20% Agree
- 40% Disagree
- 60% Totally disagree

After:
- 20% Totally agree
- 60% Agree
- 20% Disagree
- 0% Totally disagree
Students agree with the integration of BLS in their PE curriculum

Systematic integration of a BLS cycle in the PE curriculum?

Theoretical concepts and practical training about BLS are interesting
Feasibility and relevance

✓ SWOT analysis by the students and the PE teacher:

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>- Fast results on lifesaving skills</td>
<td>- Buy/rental of specific material</td>
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<tr>
<td>- Students motivation</td>
<td>- 50min class are too short</td>
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<tr>
<td>- Limited need for sport facilities</td>
<td>- No certificate delivered to students</td>
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<tr>
<td>- Physical literacy/accountability</td>
<td>- No objective practical assessment</td>
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<tr>
<td>- PE role highlighted in society</td>
<td>- Large groups of students</td>
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<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
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<td>- Adapt (add first aid) the cycle to obtain an</td>
<td>- Competencies of the PE teacher in BLS must be sufficient</td>
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<td>European BLS certificate</td>
<td>- Unknown long-term effectiveness</td>
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<td>- Integrate BLS earlier in the PE curriculum</td>
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<td>(primary-secondary school continuum)</td>
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</table>
Conclusions
✓ Fast and conclusive enhancement of the confidence, knowledge and practical competencies about BLS

Confirm existing results (Colquhoun, 2012)

✓ Need for an official recognition of the BLS cycle for the students

Guidelines for a certificate delivered in the school context (Lukas et al. 2016)

✓ Need for an official recognition of the BLS cycle in the PE curriculum

Develop in-service training for PE teachers (Plant & Taylor, 2013)
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References


