Development and validation of a water safety test for children in three age groups

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Introduction

Swimming: mandatory in Flanders
→ In (your) final attainment levels?

Primary school: “can move & play in the water and feel safe, able to swim” (11-12y)
Secondary school: “can perform one stroke efficiently, master some preparatory actions of life saving” (13-14y)

→ Care of self & care of others (Quan et al., 2011)
Introduction

- Drowning = major cause of childhood mortality → causes of drowning as background of swimming instruction
- Swimming lessons: reduction risk of drowning (1-4 y) (Brenner, 2009)
- Child that can swim ≠ can survive
- Swimming mastery is the combination of mastering a variety of aquatic skills
- Danger of overestimating skills (male youngsters, parents, non-experts)
- Not only skills, also knowledge & attitude

Aquatic Skills

<table>
<thead>
<tr>
<th>Description of categories</th>
<th>Aspect</th>
<th>Program</th>
<th>Motivation</th>
<th>Motor skills</th>
<th>Musical</th>
<th>Safety</th>
<th>Rescue</th>
<th>Under water</th>
<th>Swimming</th>
<th>Survival</th>
<th>Pool</th>
<th>Freestyle</th>
<th>Foetal</th>
<th>Back stroke</th>
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<tbody>
<tr>
<td>Basic swimming programmes</td>
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<td>Paralympics</td>
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Methods pilot study 1

Participants: Convenience sample of 77 pupils (11y-12y) enrolled in the highest grade of two municipal elementary schools (same swimming pool)

Traditional swimming test: enter, swim 50m in stroke of choice & leave pool without any form of aid during the last but one swimming lesson, evaluated by class teacher

Those who succeeded performed a water safety test during the last swimming session, evaluated by teacher and researcher/expert
Water Safety test:
item scores 0-1-2, max total score 20
(Soons, Van Iseghem & De Martelaer, 2013)

Water safety score (5 point Likert scale)
was given after both swimming tests

<table>
<thead>
<tr>
<th>Score</th>
<th>The according situation</th>
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<tbody>
<tr>
<td>0</td>
<td>The pupil should by no means be allowed in the pool by himself.</td>
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<tr>
<td>1</td>
<td>The pupil is able to swim in the shallow end of the pool without extra supervision.</td>
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<tr>
<td>2</td>
<td>The pupil is able to swim in the deep end of a public or private pool without extra supervision.</td>
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<tr>
<td>3</td>
<td>The pupil is able to swim in a lake or a pond without extra supervision.</td>
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<tr>
<td>4</td>
<td>The pupil is able to swim in the guarded areas of the Atlantic Ocean without extra supervision.</td>
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</table>
The water safety scores differed significantly $t(df=51)=6.39; p<0.0005$ between: teacher ($m=3.21$ after 50m and 3.40 after WS) > researcher/expert ($m=2.56$ after 50m 2.65 after WS).

Comparing average total score for water safety skill test, the teacher ($m=16.15; SD=3.02$) gave significantly ($t(df=51)=7.366; p<0.0005$) higher scores than expert ($m=13.62; SD=2.79$).

Majority of pupils who passed traditional test (50m) were not able to perform all the water safety skills correctly: 44/52 pupils failed at least two of the tested skills.

Red (mean item score < 1.5 / 2), green (mean item score ≥ 1.5 / 2) for both observers
Water Safety test:
item scores 0-1-2, max total score 20
(Soons, Van Iseghem & De Martelaer, 2013)

Participants: Convenience sample
of 55 pupils: 6y (n=19), 9y (n=10) & 12y (n=16+10)
Three different Water Safety tests: score 0-1-2 on skills
Methods: pilot study 2

9 y- part A

9 y- part B

9 y- part C

12 y- 50m
Results pilot study 2

The water safety tests at 3 levels as constructed in pilot 2:

- **6y**: separated skills, very easy,
- **9y**: two clustered scores → more details in scoring, very easy
- **12y**: backstroke, depending group → accent program / teacher

→ **Horizontal** score system (target age) & **vertical** score system (target skill in time)

Discussion / Conclusion

- **Traditional test (swim 50m)** should not be treated as a golden standard for assessing children’s aquatic skills.

- The **water safety test**, as constructed in **pilot 1**, approaches a more valid assessment of the competences necessary to swim safe. Only one test moment (12 y?), used as a certificate obliged to participate in water recreation: rowing, kayak, SUP, wind & golf surf, …)

- The water safety tests at 3 levels as constructed in **pilot 2**, help us to work out horizontal & vertical score data bank
Cross the bridge(s) of:

Practice & Research

Progression (database proces) and / or test (swimming diploma / certificate)

International / European level

Practice: new approach in development (baan 4= lane 4)
Instructors → Teacher training programs: more focus on: relevant water safety skills and evaluating efficiency of swimming instruction

Links: Physical Literacy, Water safety, lifelong water recreation, competition

Managers: cooperation local swimming pool with schools, clubs, … → strategy content & organisation

Educate parents

Research: Search keyword swim* + .....  

- Lots of factors: infrastructure & material, instruction & guidance, amount of lessons, time to practice, age, sampling… (Peden & Franklin, 2012)

- Inter-rater reliability between teachers with the same background is necessary, water safety test can also be examined for reliability in time based on video images
Research: Search keyword swim* + ..... 

• Studies to measure the efficiency of different teaching methods (ex. Mornard et al., 2014) and prevention strategies (McIntosh, 2014)

• Estimation of risk reduction in effect evaluation studies (for example Brenner) is difficult (McIntosh, 2014)

• 9 steps to change ‘swimming’ competition.... (cfr keynote Cardinal, 2014)