Sport meets Health:

Understanding the importance of self-perception of children's physical literacy in swimming and water safety

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4th International Conference of Sport for Development and Peace http://icsdp.event.upi.edu/





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DROWNING PREVENTION IN THE SOUTH-EAST ASIA AND WESTERN PACIFIC REGIONS 2019 SUMMARY BRIEF

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South East Asia - Hot Spot for Drownings





Fig. 1: Share of global drowning deaths by WHO regions, 2016





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3. Drowning kills our future

Drowning is a leading cause of death for children and young people. Globally, the highest drowning rates are among children aged 1–4 years, followed by children aged 5–9 years.³

In the South-East Asia Region,³ drowning as a cause of death ranks second for those in the age group 10–14 years, third for those 5–9 years old, sixth for those 15–24 years old and seventh for those under 5 years. In Bangladesh, drowning accounts for 43% of all deaths among children aged 1–5 years, claiming more lives than diseases of primary concern such as diarrhoea (2%). Drowning is *the* leading cause of death of children in Thailand,⁵ accounting for 34–47% of total deaths in 1999-2012,³ with age-specific rates ranging from 7.7 to 11.5 per 100 000 children.

Drowning is everyone's business





4. Drowning is everyone's business

Drowning is not only a public health issue but also a socioeconomic development challenge. It presents a massive challenge when taking into account its impact on human capital and its economic burden to society. Drowning prevention is an essential element to achieve the 2030 Agenda for Sustainable Development, including the Sustainable Development Goals on health and well-being (SDG 3), on quality education and development (SDG 4), and on sustainable cities and communities (SDG 11).



Developing children's swimming skills for Sport and Health Goals



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In line with the United Nations development issues for 2015-2030, namely: "Sustainable Development Goals" which specifically stipulated in the field of sports the issue of "Sport for Development & Peace"

Sports as a vehicle for the development of positive youth



Drowning is preventable

5. Risk associated with drowning

Drowning is preventable. Epidemiological data can help us identify major risk factors, including the profile of victims, place of occurrence and local conditions.

Who is at risk?

- Age: young children aged 1–4 years are at the highest risk of drowning
- Gender: males are twice as likely to drown than females
- Behavioural risks for babies and young children: lack of effective adult supervision
- Behavioural risks for teenagers and adults: alcohol use, inability to swim, working in and around water, medical emergencies
- Poor and marginalized families: illiteracy of mothers, low family income, increased maternal age and family size

Where are the risks?

- In and around households: buckets, bathtubs, ponds and swimming pools
- Living near water, including open wells and waterways
- Travelling on water
- Flood-prone areas with limited preparedness in warning and evacuation

Under what conditions?

- Lack of physical barriers between people and water
- Uncovered or unprotected water supplies and lack of safe water crossings
- Lack of water safety awareness and risky behaviour around water
- Travelling on water, particularly in overcrowded vessels without safety equipment
- Flood disasters
- Lack of individuals trained in safe rescue and resuscitation





Actions can be taken

Community-based actions

Action#1: Control access to water

- Covering wells and cisterns by the use of a pump to keep the water source covered while water is drawn.
- · Using doorway barriers and playpens
- Fencing swimming pools with four-sided, child-resistant fences and self-closing gates with safety latches.
- Legislating for the implementation and enforcement of policies, standards and building codes to support these measures.

Action #2: Safer places and care for pre-school children

 Community-based, adult supervised child care for pre-school children

Action #3: Water safety skills to school-age children

- A structured, safety-tested curriculum
- safe training environment
- Trained instructors

Action #4: Training bystanders

- Safe rescue techniques
- Effective resuscitation

Action#5: Public awareness with focus on young children

- Public awareness directed at specific risk factors, linked to programs and strengthened enforcement
- Signage at high risk settings
- Social marketing and media training

Effective policies & legislation

Action#6: Develop and enforce safety regulations on water transportation

- Vessel safety regulations, including maximum capacity and adequate personal floating devices, as well as vessel maintenance
- Regulations on vessel operators: skills and blood alcohol concentration

Action#7: Preparedness and management of flood and other natural disasters

- Disaster preparedness plans with strong community awareness and education.
- Effective early warning systems, evacuation plan
- Land use planning
- Water safety awareness and skills

Action#8: Multi sectoral coordination

- Strengthen coordinating platforms to encourage contributions from communities, NGOs, private sector and academics
- Streamlining co-benefits with other sectors

Action#9: Develop and implement national water safety plan

 National plan should aim to raise awareness, lead to effective multisectoral response, clear implementation structure and monitor actions with targets

Information systems

Action#10: Research and information system

- Address priority research questions with well designed studies
- Strengthen national information system







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Australian Definition of Physical Literacy

Physical literacy involves holistic lifelong learning through movement and physical activity. It can help Australians at every stage of life develop and maintain positive physical activity behaviours and delivers physical, psychological, social and cognitive health and wellbeing benefits

"No matter how many sidewalks we build, no matter how many parks we construct, no matter how much we urge people to get involved with physical activity, they simply won't do it unless they have the **ability, confidence,** and **desire** to be physically active."

American Surgeon General, Vivek Murthy (2015)

Competence + Confidence + Motivation





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Physical Literacy

Physical literacy is the **skills**, **knowledge** and **behaviours** that give us the **confidence** and **motivation** to lead active lives.

It involves holistic, lifelong learning through movement and physical activity.

It delivers **physical**, **psychological**, **social** and **cognitive** health & wellbeing benefits for all Australians.



SPORTAUS

The Australian Physical Literacy Framework (APLF)



The APLF has 4
 Domains and 30
 Elements

Physical - 12 items,
 Psychological - 7 items
 Social - 4 items
 Cognitive - 7 items

https://www.sportaus.gov.au/__data/assets/pdf_file/0019/710173/35455_Physical-Literacy-Framework_access.pdf

MEASUREMENT OF PHYSICAL LITERACY IS COMPLEX





Importance of perception

 In young children positive physical self-perceptions are important to physical activity, so comprehensive measurement of perceived physical literacy is important

Importance of a focus on perception

For land based movement skills, having high perceptions of competence can aid children's motivation to be physically active Bardid, F., et al (2016)

BUT

In the water this could have dire consequences

Scant research examining this topic



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Assessment of water/swim competence

How is **quality assessment** defined and enacted in physical activity and sport?

Important to have assessment tools in the context of **swim safety**

Whilst importance of actual swim assessment is clear, there is also a place for **self-perceived assessment**

A self perception tool could be used:

- before a school camp (with parent report)
- before swim programs to help sort groups (with parent report)
- to help identify children who may be 'overconfident' and at risk

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Development of the PL-C Quest



Development of a self-report scale to assess children's perceived physical literacy

Lisa M. Barnett , Emiliano Mazzoli , Melanie Hawkins , Natalie Lander , David R. Lubans , Sallee Caldwell , Pierre Comis , Richard J. Keegan , John Cairney , Dean Dudley , Rebecca L. Stewart , Gareth Long , Natasha Schranz , Trent D. Brown & Jo Salmon





 Cognitive domain – Safety and Risk



 Cognitive domain – Understanding Rules

Take Away Points from testing of instrument

- 1. Responses aligned with information we have on actual levels e.g., boys higher in many fitness domain
- 2. Use of the PLC-Quest can inform programming actions for children in sport and education
- Two items have swimming contexts one about understanding where it is safe to swim and one about understanding rules in a swimming pool





Validity Evidence for the Pictorial Scale of Perceived Water Competence short form (PSPWC-4)

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AIESEP World Congress 2022 (15-18 June) Gold Coast

Purpose of assessment

If scores from a self-report instrument align with actual competence, then swimming organisations and teachers could assess children's water competence as a **preliminary screening process** to assess risk before they are in the water

Caution – This will always be a guide







Study Aim

The aim was to create a brief self report swim scale for children and test for associations with actual swim competence







Methods – Perception Instrument

We purposefully selected four critical scenarios from an existing instrument designed to measure child self reported swimming and water safety competence

The four scenarios selected were considered reflective of critical swim and water safety skills based on feedback from swimming teachers and that could be feasibly used in swim programs







The PSPWC was an initiative of the AIESEP Early Years SIG

Designed for children to report their perceived competence using three difficulty levels for 17 swimming scenarios

MANUAL TESTING

Pictorial Scale of Perceived Water Competence (PSPWC)



Research group



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Version 1.2 (November 2020)







Situation 14 – Vertically treading water (Aquatic fundamentals: WO, B, P; depth of water: DW)

• Presentation to the child: "In this situation, the child is treading water."

Table 15 - Description of the three levels of progression of the situation 14.

Level	Description	
1	The child grips the board of the pool but does not leave the wall and does not dare to tread.	
2	The child is vertically treading water with a floating device.	
3	The child is vertically treading water without any floating device and can keep his/her head above water.	





Scale ability to distinguish competence



Having more than three response options can help distinguish between competent and highly competent children





Methods - Extending the responses

Four of 17 scenarios were selected and extended to a four-point response scale by adding an extra difficulty level:

- retrieving an object in deep water
- swimming on front
- swimming on back
- treading water

In this skill the child tries to tread water. Pick the picture that is the most like you if you were doing this?"

A, B, C, D







The PSPWC-4 had excellent internal consistency (α =.89)

Actual Swim Levels (note not all competencies mentioned)

А	Little or no previous water experience	
В	Push and glide to flutter kick 3 metres, face in the water Kick on back 5 metre with flotation aid, ears in the water Submerge body while blowing bubbles Aided 30 second float signal for help	
С	Entry and exit from deep water 10 metres backstroke - introduction only 10 metres freestyle - introduction - only Introductory Survival Sequence	
D	 15 metres of backstroke and freestyle using efficient technique 5 metres introduction to lifesaving backstroke kick with board 5 metres introduction to breaststroke kick with a board Surface dive, underwater swim 3 metres & recover object of chest depth 	
Е	25 metres of freestyle and backstroke using efficient technique. 10 metres lifesaving backstroke using efficient technique Survival Sequence with clothes	
F	Swim continuously for 100 metres using efficient technique in freestyle, backstroke, lifesaving backstroke and breaststroke. Survival scull, float or tread water for 4 minutes whilst wearing long-sleeved shirt and trousers.	
G	Swim 250 metres continuously using efficient technique in freestyle, backstroke, lifesaving backstroke, breaststroke& sidestroke Survival scull, float, tread water or eggbeater kick for 3 minutes	





Actual Swimming Competence

- Determined based on one of seven levels of skill (A, B, C, D, E, F, G)
- System specific to swimming provider
- Few children achieved higher than D (*one criteria is 15 metres of backstroke and freestyle*), so levels D to F were collapsed for analysis
- No child reached level G (one criteria is swim continuously for 250 metres in 5 strokes)



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Sample



Parents whose children had participated in at least <u>one</u> <u>swim-intensive program</u> (one to two weeks) in the last year



Mean age 6.9 years (SD=1.9)







Analysis



Perceptions of 139 children tested for association

with



Certificate data of actual swim competence pre (n = 139) and post-program (n = 30)



Note - Certificates at pre were from parent stating which level child was up to, at post from swimming teachers entering level achieved





Results

Moderate positive correlations between swim level at program start & perception of:

- Retrieving object in deep water (rho=0.57)
- Swimming on front (rho=0.60)
- Swimming on back (rho=0.69)
- Treading water (rho=0.63)
- Summed score (rho=0.71)

Ah.

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After adjusting for sex and age, higher perceived skill was still significantly associated with increasing achieved skill levels

For the sub-sample, the correlation between their final achieved swimming level and the summed perceived score was rho = 0.64



Conclusion



• Evidence for the use of a four-item developmentally appropriate scale to assess child perceived swimming competence



Scale briefness means it could have utility for large scale use

!
N

• Some information is lost when not using the full scale, as four items cannot represent a complete picture of a child's perceived swimming competence

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Further research needed on reliability and validity





Acknowledgements

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Swimming Sports - vehicle for development of positive youth

Developing children's physical literacy – *including on the water* – will assist to develop the whole person– their *physical, cognitive, social and psychological selves*

As such, this focus can be seen as 'Sports as a vehicle for the development of positive youth'



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Take home points

- Can you move from an elite sport focus to developing water skill competency?
- ✓ These children may continue on to participate in swimming sports, regardless, this action will help to reduce drownings

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What potential research endeavours will assist in your country?







Thank you for your interest

Thank you to my wonderful collaborators and students @LisaBarnettPhD