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Parental Perceptions of Water Competence and Drowning Risk for Themselves and Their Children in an Open Water Environment

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Abstract

Little is known about people's perceptions of how much swimming competency is required to provide protection from drowning, especially in open water environments where most drowning incidents occur. This study reports on parental perceptions ($n = 309$) of swimming competency of themselves and their children and parents' beliefs on their safety when swimming in open water. Most parents (58%) considered themselves *good/very good* swimmers, although more than half (55%) considered that they could swim 25 m or less. Most parents (87%) reported that their children could swim, with more than one-half (52%) believing that their child's swimming competency was *good/very good*, yet most (74%) considered their child could swim only 25 m or less. Most parents (59%) and almost all children (81%) had never actually swum their reported distance in open water. In spite of these low levels of competency, one-half (51%) of parents thought their children were *safe/very safe* in open water. We discuss the implications of holding an overly-optimistic belief in the protective value of minimal levels of swimming competency for open water safety. Further exploration is recommended regarding the differences between real and perceived swimming competency especially among at-risk groups such as male children and adults.

Keywords: real and perceived swimming competency, drowning prevention, child safety, parental perception, water safety

Introduction

Water competence has long been regarded as a critical safety factor in the prevention of drowning. Recent work has identified the dynamic interaction of person, activity, and environment and the consequent changing competency base required for the prevention of drowning in recreational activities (Langendorfer, 2011). From a drowning prevention perspective, levels of water competence need to be flexible to allow for the differences between people, activities, and environments. The person who can float for a set time or swim a certain distance in a warm pool wearing only a swimsuit may not be able to repeat those same competencies to the same level of competency in a cold, open water environment fully clothed. Further, how people perceive their swimming competency in open water influences their perception of their safety and their potential risk of drowning. The purpose of this paper is to explore the perceptions of swimming competency and drowning risk that informs people's understanding of their safety and that of others in their care in an open water environment.

Traditionally, water competence has been measured by distance swum. Distances have been set arbitrarily, increasing sequentially with age, often tested in

isolation without association to other survival competencies. Almost invariably tests have been conducted in the benign conditions of a closed water environment such as a tepid swimming pool. For example, in New Zealand, a distance of 200 m (WSNZ, 2015) is set as a benchmark for all school children to achieve by the time they have completed primary school (approximately 11 years). In the UK, the highest level of the ASA *Learn to Swim* Pathway contains a continuous swim of 100 m, 25 m of each of the four competitive strokes and a separate routine of other water competencies (ASA, 2015). The Canadian Lifesaving Society *Swim to Survive* program standard is set at 50 m but includes a roll into deep water as well as treading water for one minute (Lifesaving Society Canada, 2015). Australia's Royal Life Saving Society's *Swim and Survive* program requires a swim of 150 m swim using various strokes and completion of other water safety skills at Level 4 (RLSSA, 2015) - a target set for all children to achieve by the end of primary school (Australian Water Safety Council, 2012). An international position statement recommended completing a minimum distance of 25 m in addition to a range of other water safety skills including water entry/exit, floating, and rescue skills (International Life Saving Federation, 2012). A review of 14 international organizations found variable distance requirements within their tests of water safety with 25 m being the most frequently reported distance although the authors noted that the skills and competencies will be environment- and task-specific (Quan, Ramos, Harvey, Kublick, Langendorfer, Lees, et al., 2015). A recent study in Bangladesh used a 25 m distance as a measure of 'naturally acquired swimming ability,' the assessment being conducted in open water deeper than the candidates' own height and included being able to exit the water (Rahman, Linnan, Mashreky, Hossain, & Rahman, 2014).

A major issue regarding the protective value of water competency in drowning prevention is the degree to which those competencies transfer to open water environments. Langendorfer (2011) discussed water competence as part of a 'dynamical system' where water competence may need to change in response to variable demands. Using Karl Newell's (1986) model of motor coordination and control, Langendorfer suggested water competence ought to be viewed as "an emergent and potentially transient systemic behavior, mediated by interactive relationships among a person's individual characteristics, their perceived goal at any point in time, and the environment context" (p. 237). For example, a person capable of swimming comfortably and continuously in a warm, calm, and shallow pool may be severely challenged while swimming the same distance in a rough, cold, open water environment at the beach, lake, or river. In the pool environment, being able to swim 25 m or less may be 'good enough' and the person considered of 'can swim' status; at a surf beach or in a swift moving river, the levels of

competency may not meet the demands of the situation and result in fatal consequences.

In addition to the plasticity of swimming competency placed upon it by variable environmental demands, the adequacy of its protective capacity is confounded by people's perception of their competency, both in general and specific to the aquatic situation. The lack of an international measure to define swimming competency is suggested as one reason that people may have an inflated self-efficacy of their swimming competence (Dixon & Bixler, 2007). Research has suggested that an overestimation of competency has significant impact on the risk of drowning in open water, especially for males (Moran, 2008a; McCool, Moran, Ameratunga, & Robinson, 2008; McCool, Ameratunga, Moran, & Robinson, 2009). The 'Can You Swim?' research (Moran, Stallman, Kjendlie, Dahl, Blitvich, Petrass, et al., 2012; Stallman, Dahl, Moran, & Kjendlie, 2010; Petrass, Blitvich, McElroy, Harvey, & Moran, 2012) has shown that gaps exist between perceived and real swimming competence. Collegiate physical education students self-estimated greater competencies for floating and swimming on their backs than they could actually perform when tested in a pool. In an open water environment and with populations of less advanced water competency, these differences are likely to be even greater. Significant differences between estimations and actual competencies have been shown with other survival competencies such as swimming in moving water (Kjendlie, Pedersen, Thoresen, Setlo, Moran, & Stallman, 2013), in clothes (Moran, 2014b; 2015), and exiting the water safely (Moran, 2014a).

Both knowledge and physical competencies affect perception of risk (Moran, 2006; Moran, 2008a; McCool et al., 2008; Morrongiello, Sandomierski, Schwebel, & Hagel, 2013; Morrongiello, Sandomierski & Spence, 2013). An underestimation of the risk may lead to incidents, injuries, and fatalities. Gaps between the perceptions of risk and the actual risk can lead to at-risk behaviors, often with serious consequences. A low perception of the risk of water-related injury or drowning has been shown to be associated with higher self-reported swimming skill and at-risk swimming behaviors, especially among males (McCool, et al., 2008; Moran, 2008a; Moran & Willcox, 2010). When people perceived themselves as being more competent swimmers they were more likely to engage in riskier behaviors in aquatic environments.

What we currently do not know is the level of competence at which people feel that they, or others in their care, are safe to swim in open water environments. While some evidence is available on parental perceptions of safety and risk at the

beach (Moran, 2009; 2010), little information is available on what constitutes ‘safe’ levels of swimming competence for self or others in open water. We hypothesize that when real and perceived swimming competency are widely disparate, the risk of drowning is greater. This study aims to explore the relationship between perceived swimming competency and risk of drowning in an open water environment. To achieve this, we set the following objectives:

1. Determine the perceived swimming competence of parents/caregivers and their children;
2. Determine what parents/caregivers perceive to be a competent swimmer in terms of drowning prevention for themselves and their children;
3. Determine if actual swimming competency in open water affects the perceived level of safety; and,
4. Determine what level(s) of swimming competency the public consider is required to be safe in open water.

Method

This cross sectional survey study used a self-completed, anonymous questionnaire to gain a greater understanding of the perceptions of parents of their own water competency in open water, and that of their child. A convenience sample of parents of primary-aged children was invited to participate in the study during an autumn school term (May-June). There was no obligation by parents to participate. The surveys were either returned directly to the researcher or to the class teacher. Research ethics approval was obtained from the University of Auckland (Reference number AUHPEC 10065).

Participants

Principals at five primary schools were invited to be involved in the study. The specific schools were selected because of their different geographic locations within the Auckland region and their differing socio-economic status (as measured by the Ministry of Education decile rating based on a composite score of household income, occupation, educational qualifications, and income support). Parents or caregivers of primary aged children (5 – 11 years) at the five schools were invited to complete a self-report, written questionnaire. A total of 309 parents or caregivers participated by returning completed surveys.

Research Instrument

The survey was designed to be completed by the parents in their own time at home and take about 10 minutes to complete. The questionnaire consisted of 18 close-ended questions, the first four related to demographic detail of age, sex, ethnicity, and length of residency. The following four questions asked participants about

whether they could swim, and, if so, their swimming competence using four response categories ranging from *poor* to *very good*, and how far they thought they could swim. Further questions probed when they had last swum the distance in a pool and in open water. The same questions were asked regarding the swimming competence of their children. In addition, parents were asked what level of swimming competency all children should attain by the end of primary school education (11 years). To ascertain their water safety attitudes, a series of six statements using a three response Likert scale of *agree*, *disagree*, and *unsure* was included. Two summative questions sought information on their sense of safety when swimming in open water for themselves and their children using four response categories ranging from *very unsafe* to *very safe*. Content validity was determined via expert opinion with the research tool reviewed by peer appraisal. To ensure reliability, a group of parents not involved in the main study were asked to participate in a test-retest pilot study prior to undertaking the research (Watson et al., 2003). Minor amendments were then made to the questionnaire prior to data gathering in the main study.

Analysis

Data received were entered into IBM SPSS Statistics version 22. Frequency and percentages were calculated to report categorical variables such as demographic information and perceptions of competence and risk. Chi-square tests were used to determine associations between dependent variables such as perception of water competence and independent variables such as gender or length of residency.

Results

A total of 309 parents or caregivers completed the questionnaire. Most (61%, $n = 187$) were female, mainly aged between 30-44 years (57%, $n = 174$) and had lived in New Zealand for ten years or longer (77%, $n = 239$). More than one third of the participants were New Zealand European in origin (39%, $n = 121$), and around one fifth each identified as Maori (17%, $n = 53$), Pasifika (17%, $n = 53$) or Asian (13%, $n = 35$). Two thirds of participants (67%) considered that they could swim.

When asked to elaborate on their swimming competence, most parents (58%) considered themselves *good/very good* swimmers (see Table 1). When self-reported swimming competence was calculated by gender, significant differences ($\chi^2(1) = 8.347$, $p = 0.004$) were found with more males than females likely to perceive their swimming competence to be *good/very good* (68% vs. 51%). Reporting swimming competence by ethnicity also showed significant differences ($\chi^2(1) = 18.962$, $p = < 0.001$) with parents who identified as New Zealand European and Maori origin more likely to report a *good/very good* level of swimming

compared with parents of all other ethnicities (68% vs. 44%). Although not statistically significant, long-time residents (those who had lived in New Zealand for more than ten years) tended to report *good/very good* swimming competence level compared to more recent residents to New Zealand (61% vs. 49%).

Table 1 - Parent Self-Estimated Swimming Competency in Open Water by Gender

	Male (n = 119)		Female (n = 187)		Total	
	n	%	n	%	n	%
How would you estimate your swimming competency? (n=306)						
Good/Very good	81	68.1%	96	51.3%	177	57.8%
Poor/Fair	38	31.9%	91	48.7%	129	42.2%
How far would you estimate you can swim nonstop? (n=306)						
Less than 25 m	50	42.0%	117	62.5%	167	54.5%
More than 25 m	69	57.9%	70	37.5%	139	45.3%
Have you ever swum this distance in open water? (n=300)						
In open water	62	53.4%	61	33.2%	123	41.0%
Not in open water	54	46.6%	123	66.8%	177	59.0%
When did you swim this distance in a pool? (n=267)						
Less than 1 year	71	65.8%	93	58.5%	164	61.5%
More than 1 year ago	37	34.2%	66	41.5%	103	38.6%
When did you swim this distance in open water? (n=124)						
Open water <1 year	30	48.4%	24	38.7%	54	43.6%
Open water >1 year	32	51.7%	38	61.3%	70	56.5%

Participants were asked how far they thought they could swim. More than half (55%) considered that they could swim 25 m or less. Cumulatively, almost three quarters (73%) estimated they could not swim more than 50 m. Significant differences were evident when estimated distance swum was analyzed by sex ($\chi^2(4) = 14.244, p = 0.007$). Females were almost twice as likely as males to report they could not swim (10% vs. 5%) or swim 25 m or less (53% vs. 37%). In contrast, males were twice as likely to report being able to swim more than 200 m (22% vs. 11%). Significant differences in estimates of distance swum were also evident when reported against ethnicity with New Zealand European-origin parents estimating greater distances than non-European parents ($\chi^2(4) = 50.529, p = < 0.001$). Parents who identified as being non-New Zealand European origin were twice as likely to report being able to swim 25 m or less (67% vs. 29%). New

Zealand European-origin parents were more likely to report being able to swim more than 200 m when compared with parents of all other ethnicities (29% vs. 6%).

Almost two-thirds of respondents (62%) reported they had swum this distance in a pool in the previous year; however, more than one-half (59%) reported never having swum the distance in open water. Significantly more males than females (53% vs. 33%) reported that they had swum the distance in open water ($\chi^2(1) = 12.116, p = 0.001$). Parents who identified as New Zealand European-origin were more likely than parents of all other ethnicities (51% vs. 34%) to report they had swum the distance in open water ($\chi^2(1) = 8.070, p = 0.005$).

Table 2 shows parental estimates of their child's swimming competency. Almost all parents (87%) reported that their child could swim with more than one-half (52%) believing that their child's swimming competency was *good/very good*. When swimming competence was reported by length of residency in New Zealand, significant differences ($\chi^2(1) = 11.869, p = 0.001$) were found with long-term residents (those who have lived in New Zealand for more than ten years) more likely to report *good/very good* child swimming competence compared with those of more recent residency (61% vs. 39%). Parents who identified as Asian ethnicity (Chinese, Korean, or Indian) were significantly more likely than other ethnicities (63% vs. 46%) to report a *poor/fair* level of swimming competence ($\chi^2(1) = 4.044, p = 0.044$). No significant gender differences were evident in parental estimates of child swimming competence.

Table 2 - Parental Estimates of Child Swimming Competency by Gender

	Male (n = 119)		Female (n = 187)		Total	
	n	%	n	%	n	%
How would you estimate your child's swimming competency? (n=306)						
Good/Very good	59	49.6%	100	53.5%	159	52.0%
Poor/Fair	60	50.4%	87	46.5%	147	48.0%
How far would you estimate your child could swim nonstop? (n=306)						
Less than 25 m	86	72.3%	142	75.9%	228	73.5%
More than 25 m	33	27.8%	45	24.1%	78	25.5%
Has your child ever swum this distance in open water? (n=302)						
In open water	22	18.6%	37	20.1%	59	19.5%
Not in open water	96	81.4%	147	79.9%	243	80.5%
When did your child swim this distance in a pool? (n=255)						
Less than 1 year	91	92.8%	148	94.2%	239	93.7%

More than 1 year ago	7	7.1%	9	5.7%	16	6.3%
When did your child swim this distance in open water? (n=59)						
Less than 1 year	18	68.2%	32	89.9%	50	84.8%
More than 1 year	5	21.7%	4	11.1%	9	15.3%

When asked how far parents thought their children could swim, three quarters (74%) considered their child could swim 25 m or less. A small proportion (7%) reported that their child could swim more than 200 m. Most parents (81%) reported their child had not swum the distance in open water with no significant difference between reports by male or female parents. Parents who identified as New Zealand European-origin were more likely than those of all other ethnicities (27% vs. 9%) to report their child could swim more than 50 m ($\chi^2(1) = 22.187, p = <0.001$). Asian parents were more likely than other parents (95% vs. 71%) to report their child could swim 25 m or less ($\chi^2(1) = 9.800, p = 0.044$). No statistical differences were found when parent estimates of their child's swimming competency were analyzed by gender or residency.

When asked how far children should be able to swim at the completion of primary school (approximately 11 years of age in New Zealand), more than half (54%) considered 25 m an appropriate distance. A further 23 per cent of parents considered that all children should be able to swim 50 m while a small proportion thought children should be able to swim 200 m or more. When reported against ethnicity, twice as many New Zealand European parents than other parents (34% vs. 17%) thought that all children should be able to swim more than 50 m by the completion of primary schooling ($\chi^2(3) = 13.039, p = 0.005$).

Table 3 - Attitudes toward Water Safety and Risk of Drowning by Gender

	Agree		Disagree		Unsure	
	Male n/ %	Female n/ %	Male n/ %	Female n/ %	Male n/ %	Female n/ %
My swimming ability will keep me safe in open water (n=305)	90 (76.3%)	110 (58.8%)	17 (14.4%)	42 (22.5%)	11 (9.3%)	35 (18.7%)
Others are at greater risk than me when swimming in open water (n=303)	60 (51.3%)	73 (39.2%)	27 (23.1%)	44 (23.7%)	30 (25.6%)	69 (37.1%)

My current swimming fitness will keep me safe in open water ($n=304$)	73 (62.4%)	74 (39.6%)	23 (19.7%)	66 (35.3%)	21 (17.9%)	47 (25.1%)
My swimming ability means I don't need to wear a lifejacket in a boat ($n=304$)	20 (17.1%)	22 (11.8%)	92 (78.6%)	163 (87.2%)	5 (4.3%)	2 (1.1%)
Wearing of lifejackets on boats should be compulsory for children ($n=305$)	108 (91.5%)	184 (98.4%)	6 (5.1%)	1 (0.5%)	4 (3.4%)	2 (1.1%)
Wearing of lifejackets on boats should be compulsory for adults ($n=304$)	86 (73.5%)	169 (90.4%)	22 (18.8%)	9 (4.8%)	9 (7.7%)	9 (4.8%)

Parents were asked to respond to six statements about water safety for themselves and their child (see Table 3). Two-thirds (66%) of parents agreed that their swimming competence would keep themselves safe in open water, and significantly more males than females (76% vs. 59%) reported more confidence in the protective nature of their swimming ($\chi^2(2) = 10.018, p = 0.007$). Almost one half (49%) of parents reported that their current swim fitness would keep them safe. Male parents were significantly more likely than females (62% vs. 40%) to have confidence in their swimming fitness to keep them safe ($\chi^2(2) = 15.423, p = <0.001$). Many parents (44%) thought that others were at greater risk than themselves in the water, and, although not statistically significant, quantitatively more males believed that they were safer than others in open water (51% vs. 39%). Most parents (84%) believed they should wear a lifejacket in a boat and, although not significantly different, slightly more females than males expressed a safer attitude (87% vs. 79%). Significantly more females than males (90% vs. 74%) thought that lifejackets should be compulsory on boats for adults ($\chi^2(2) = 17.264, p = <0.001$).

When asked about their perception of personal safety when swimming in open water, almost two thirds (64%) of parents considered that they felt *safe/very safe*. Significantly more males than females (76% vs. 57%) were likely to feel safe in open water ($\chi^2(1) = 11.216, p = 0.001$). When compared against their self-estimated swimming competence, parents were more likely ($\chi^2(1) = 41.363, p = <0.001$) to report a greater sense of safety in open water if they could swim more than 25 m compared with those parents who estimated they could swim 25 m or less (83% vs. 48%). One-half (51%) of parents thought that their child was *safe/very safe* when swimming in open water. Significantly more male than female parents (59% vs. 45%) thought that their child was *safe/very safe* when swimming in open water ($\chi^2(1) = 5.419, p = 0.020$). Parents were more likely ($\chi^2(1) = 14.676, p = <0.001$) to report a greater sense of safety for their child in open water if they

thought that their child could swim more than 25 m compared with parents who estimated their child could swim 25 m or less (69% vs. 44%).

Discussion

The primary goal of this paper was to establish what level of swimming competency parents considered necessary to be safe in open water for both themselves and their child. This was undertaken by analyzing parental perceptions of their personal swimming competence and that of their child, together with how their level of swimming competency affected their perceived level of safety in open water.

Although most parents (67%) in this study reported that they could swim, and many (58%) perceived their swimming ability to be *good/very good*, most (55%) estimated that they could only swim 25 m or less. The self-reported competency level of parents in this study was much higher than that reported in two studies of other New Zealand-based population groups where only 13% of youth (15-19 years) (Moran, 2008a), and 7% of festival goers (Moran & Stanley, 2013) estimated they could swim up to 25 m. Another international study found that 6% of tertiary students indicated they could swim 50 m or less (Moran et al., 2012; Stallman et al., 2010) although the participants were physical education students where one would anticipate a higher proficiency level. A study of beachgoers in New Zealand (McCool et al., 2008) found that one-third self-reported they could swim less than 25 m. The estimated level of competency in this study is lower than the child population in the LIC of Bangladesh where caregivers or children reported that over half (52%) of all children aged 5-17 years could swim 25 m (Rahman et al., 2014).

Previous studies have shown that males perceive their swimming competency to be greater than that of females. Moran (2008a) found male youth were more likely to perceive a higher proficiency with significantly more males than females (37% vs. 26%) indicating they could swim more than 100 m. Male beachgoers (McCool et al., 2008) also were more confident of their swimming competency than females. A study of festival goers also reported differences in gender perception with males more confident about their swimming competence than females (68% vs. 51%) and females twice as likely as males to estimate they could swim 25 m or less. In contrast, there were no differences in perception of competency by gender for tertiary physical education students (Moran et al., 2012; Stallman et al., 2010).

Those who identified as New Zealand European or Maori ethnicity were more likely to perceive their competence as *good/very good* while Pasifika participants were more likely to perceive a lower swimming competence. These perceptions were reflected in lower swimming distance estimates. As shown in other studies (McCool et al., 2008; Moran & Stanley, 2013), New Zealand European parents were more likely to estimate

being able to swim longer distances than all other ethnicities. For those who identified as Maori, a wider gap was evident between how well they thought they could swim when compared with their estimated swimming distance. Further research is required to fully understand whether this apparent disparity between perceived and real swimming competency exists in all sectors of the community, especially among those at greater risk of drowning.

Parental optimism in the swimming competence of their child also was evident. Nearly all parents believed their children could swim with just over half perceiving their child's competency as *good/very good*. Three-quarters (74%) estimated that their child could swim 25 m or less, a distance unlikely to confer a strong protective capacity in open water. Furthermore, this study did not identify any significant gender differences in parental estimations of their child's competency as has been reported in previous studies. Moran, (2009) reported that male parents at beaches were more likely to report better child swimming competence and lower perceived risk for both themselves and their child. Differences in perceptions of child competence between ethnicities were also evident. Parents who identified as Asian were more likely than all other ethnicities (61% vs. 39%) to report a *poor/fair* level of swimming competence for their child with more Asian parents estimating their child could swim 25 m or less (95% vs. 71%). In summary, it appeared that many parents did not have an accurate perception of the level of swimming competency for themselves or their child that would afford drowning prevention protection in open water. Further research on both real and perceived water competency is required to refute or substantiate this finding.

From a drowning prevention perspective, we were concerned that most of the parents (59%) and almost all children (81%) in this study had never actually swum their reported distance in open water environments where most drownings occur. Other studies have shown the disparities between swimming in a calm pool and a simulated open water environment. The recent 'Can you swim in waves?' study (Kjendlie et al., 2013) showed that the ability to swim a set distance in a warm, calm and clear pool did not necessarily transfer to simulated rough water in the same pool. Children 11 years of age uniformly displayed decreases in performance (8-14%) in rough water compared to what they had achieved under calm pool conditions. The authors concluded that the children were unlikely to achieve the same calm water competency levels in rough, moving water in an emergency. Other studies have found that when testing 10-year old children who had already swum distances of 25 m and 100 m, many did not have the fundamental skills to keep themselves safe in open water (Junge, Blixt & Stallman, 2010; Laakso & Stallman, 2010). In addition, more recent evidence suggested that those with minimal swimming competencies were compromised to a greater extent than those with higher levels of competency by wearing clothes under simulated survival situations (Moran, 2014b, 2015).

Underestimation of risk is a serious concern for swimming in open water environments. Even though half (54%) of respondents estimated they could swim only 25 m or less, many (66%) perceived that their swimming competence would keep them safe in open water situations. In addition, one half (49%) were of the opinion that their current swim fitness levels would keep them safe. In studies about risk of drowning, males were more likely than females to underestimate the risk (Brenner, Saluja, & Smith, 2003; Gulliver & Begg, 2005). In addition, some evaluations of high risk activities such as rock fishing suggested that underestimation of the risk perception may be due to a misdirected faith in their swimming competence (Moran, 2008b).

Evidence shows that parental underestimation of drowning risk for their offspring was also a concern. The majority of parents (64%) in the current study felt safe to swim in open water and one-half (51%) perceived their child was safe swimming in open water. When parents estimated they could swim more than 25 m they were significantly more likely to report a greater sense of safety in open water. This heightened sense of safety also was apparent when they estimated their child could swim more than 25 m. This suggested that most parents believed that being able to swim over 25 m (in a pool) provided them with the protection to keep themselves and their child safe in open water, highlighting a reality gap between what parents perceive to be safe in open water and what most drowning prevention experts believe (Moran et al., 2012; Stallman et al., 2010).

An overly-optimistic belief in the protective capacity of swimming in drowning prevention is not new. A study by the authors found that more than one-third of parents (35%) believed their children required less supervision around water after having had swimming lessons (Moran & Stanley, 2006). A study of parental perception of child supervision requirements (Morrongiello, Sandomierski, & Spence, 2013) showed that parents were likely to reduce their level of supervision as they perceived their child's competency improved. Such changes in supervision cause even greater concerns when the level of competency is overestimated. Furthermore, in open water environments such as at the beach, male parents were more likely to underestimate the risk due to greater confidence in their own swimming fitness levels, estimated swimming competence, and the perception that they were safer than others in open water (Moran, 2008a). Moran (2008a) reported significantly more male parents estimated higher swimming competence for their 5–9 year-old children and twice as many males than females were likely to estimate no risk of drowning for their 5–9 year olds.

Confidence that children are safe in open water once they can swim over 25 m is reinforced in the belief by more than half (54%) of the parents that children should be able to swim up to 25 m by the end of primary school. A distance of 25 m is below many of

the standards set by international drowning prevention organizations in their award schemes (for example, RLSSA, Lifesaving Society Canada, ASA, WSNZ) where longer distances, together with demonstrating other water safety competencies, are required as a basic level of proficiency.

Limitations

The results of this study go some way toward giving us a greater understanding of how people perceive the relationship between swimming competency and safety when swimming in open water situations. There are several limitations which must be considered in interpreting these results. First, the participants of this study were parents whose child attended one of the five schools chosen as a convenience sample by the researchers. Whilst the schools were chosen from a range of decile ratings and geographic areas, they and the parents who volunteered to complete the surveys were not randomized and may not have been reflective of the general population. Second, no clear definition of swimming competency in relation to drowning prevention was presented to respondents (since none existed in the drowning prevention literature at the time of this study) and this may have led to ambiguity in responses. Third, swimming competency was self-estimated and may not necessarily be a valid indicator of swimming competence (Moran et al., 2012; Stallman et al., 2010). Similar concerns about self-reporting have been identified in other health behaviors (Mickalide, 1997; Nelson, 1996; Robertson, 1992). Fourth, accuracy of recall decreases with time so self-reporting of past swimming experience such as open water swimming and swimming distances are likely to be approximate only and reflect recall bias. These limitations notwithstanding, the results of this study are suggestive of people's understanding of swimming competency and its influence on the open water safety of adults and children.

Conclusion

This study is important because it indicates what many parents believe is the level of swimming competency required to keep themselves and their children safe in an open water environment. The results suggested that many parents considered themselves and their children to be good swimmers even though estimates of swimming distance for most adults and children were 25 m or less in a pool, and most had never swum that distance in open water. This level of optimism in the protective capacity of a minimal level of swimming competency is a cause for concern because it suggests that parents may underestimate the risk to themselves and their children when swimming in open water environments. Further research is required to determine if this minimal level of competence is perceived as being safe for open water activity by other sectors of the community, and whether perceptions of swimming competency match the reality of open water swimming demands.

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