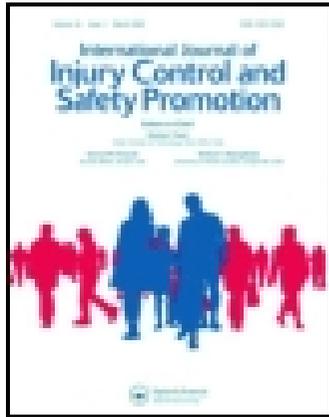


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## Parent/caregiver perceptions and practice of child water safety at the beach

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Lack of appropriate supervision is a persistent risk factor in most child drowning incidents. The risks to young children associated with swimming at beaches place a premium on close and constant supervision by caregivers. However, little is known about caregiver supervisory practice and perceptions of child water safety at beaches. Adults ( $N = 769$ ) in charge of children under 10 years of age were surveyed at 18 New Zealand beaches during the summer of 2007 to ascertain caregiver perceptions of their water safety skills, risk of drowning for their child and their supervisory behaviours. Most parents (78%) estimated that they could swim 100 m non-stop in open water, almost one half (48%) had been certified in cardio-pulmonary resuscitation and one quarter (24%) had received some rescue/lifesaving training. More than one quarter (29%) failed to provide appropriate supervision for their under 5-year olds at the beach. Almost half (46%) of caregivers did not provide close supervision for their 5–9 year olds. Although there were no significant differences between males and female self-reported supervision, male caregivers were more likely to rate their 5–9 year olds as good swimmers and less likely to estimate a high risk of drowning for that age group. To address shortcomings in caregiver supervision, it is suggested that water safety education initiatives emphasise how to provide close and constant supervision of young children at beaches. Furthermore, a focus on the necessity for caution when estimating risk and ability to cope with open water conditions is recommended.

**Keywords:** drowning prevention; risk perception; beach water safety; child supervision

### Introduction

New Zealand has the unenviable reputation among OECD countries of having one of the highest incidences of death by drowning for young children. One of the persistent risk factors identified in most child drowning tragedies is the lack of adult supervision (Cody, Quraishi, Dastur, & Mickalide, 2004). In New Zealand, the risk of drowning posed by the perceptual, cognitive, and physical immaturity of childhood is exacerbated by high frequency of exposure to risk in an aquatically oriented society with easy access to water (Moran & Stanley, 2006). In the 1–14 year age group, drowning is the second leading cause of injury death after motor vehicle incidents (Child and Youth Mortality Review Committee [CYMRC], 2005). Though the circumstances surrounding child drowning are similar to those reported in other developed countries, the drowning rate for this age group in New Zealand is almost 50% higher than its nearest neighbour, Australia (Langley, Warner, Smith, & Wright, 2001).

Although most under 5-year-olds drown in home environments, the number of children who drown at

open-water locations, such as beaches, increases with age (Gilchrist, Gotsch, & Ryan, 2004). In New Zealand from 1980 to 2002, 34% of 1–4 year olds ( $n = 110$ ) drowned in open water locations compared with 70% of 5–9 year olds ( $n = 71$ ) (CYMRC, 2005). Although most studies of child drowning have focused on risk factors in the home, little is known about parental supervisory practices of young children in open-water environments. In Canada, a study of toddlers aged 1–4 years found that only 5% of drowning incidents occurred in the presence of adults and concluded that adult supervision was critical to the safety of toddlers around unprotected waters (Canadian Red Cross, 1994). In Australia, a New South Wales study on drowning in children aged 5 years and below found that supervision was a factor in all but two cases of drowning in bodies of natural water, with around half of all children being without any adult supervision (New South Wales Water Safety Taskforce, 2002). A national study of childhood drowning in the United States found that 10% of victims were completely unsupervised at the time of drowning and that the majority (79%) of

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these children were aged 5–14 years (Cody et al., 2004).

Observational studies of victims at beaches suggest that non-swimming adults out of their depth in water are generally unable to struggle on the surface for more than 1 min, whereas infants and young children can submerge in as little as 20 s (Pia, reported in Branche & Stewart, 2001). Furthermore, drowning victims are rarely able to call for help or attract attention when in distress (Pia, 1971). Continuous surveillance and immediate reaction is thus critical to the prevention of drowning at beaches, especially among the young who are more likely to lack the survival skills required of sudden exposure to deep, open water. Furthermore, exacerbating environmental hazards including waves, rip currents, tides, cold water, and wind-chill-inducing winds are commonplace at many popular recreational beaches in temperate climates. Such conditions may heighten the risk of drowning by adding the debilitating effects of hypothermia and ‘wave splash’ to the downward spiral of respiratory failure that is drowning (Golden & Tipton, 2002). In such hazardous conditions, child survival times without adult support are likely to be very much reduced.

Not surprisingly, in response to the high rates of drowning among young children, many organisations worldwide have promoted the necessity of close and constant adult supervision of young children around water (for example, American Academy of Pediatrics [AAP], 2003 in the US; Norman & Vinceten, 2008, for the European Child Safety Alliance in Europe, and Safekids NZ, 2008, in New Zealand). Educational campaigns have used such catch phrases as *touch supervision*, *within arm’s length* and *in sight, in reach* to promote the necessity of best supervisory practice.

In New Zealand and many other OECD countries, flat-water beaches are often perceived to be safe for recreational aquatic activity and professional surveillance *via* lifeguard services is often unavailable. In such conditions, a premium is placed on parents/caregivers to provide young children with the necessary protection in an emergency. Furthermore, even though lifeguard supervision is well recognised as a highly effective intervention in drowning prevention (Branche & Stewart, 2001), work by Harrell (1995, 2006) suggests that lifeguards are less inclined to pay attention to groups of children in the belief that there is safety in numbers and that they are less inclined to scan where adult caregivers are near. The close and constant supervisory role of the caregiver thus becomes paramount in the drowning prevention chain for youngsters at the beach, irrespective of whether the beach is patrolled by lifeguards. It is, therefore, the purpose of this study to ascertain the water safety supervisory practices and beliefs of caregivers and to

make recommendations that will enhance child water safety at the beach.

### Method

A cross-sectional survey of people who used public beaches throughout the upper North Island of New Zealand was conducted during the late summer period of 2007. Eighteen patrolled and no-patrolled surf and flat-water beaches were selected because of their popularity and proximity to major urban concentrations of population. Adult beachgoers in charge of children were invited to complete a brief, self-written questionnaire of 21 questions related to their family’s water safety at the beach. Data gathering took place during 8 weekends and public holidays between January and March in the summer of 2007. This included several peak holiday weekends and it was anticipated that this period would provide an ideal timeframe to reach as many of the beach-going population as possible.

### Sample

The sample population included all people over the age of 16 years who were in charge of young children on the beach. Young children were initially defined by estimate as being aged 9 years or less. People who were unable to comprehend written English or did not wish to take part were not included in the study. Research assistants arrived at each beach between 10 and 11 am each day and stayed on the beach until at least 4 pm. The sample did not, therefore, include families and social groups with young children who frequented the beach on non-holiday weekdays and times outside ‘peak’ hours.

### Measures

The structured questionnaire was anonymous, designed to be undertaken on site, and take a maximum of 10 min to complete. The questionnaire consisted of closed questions designed to provide information on respondents’ frequency of beach use, self-estimated swimming ability of caregiver and children, self-estimated ability to rescue their child, perceptions of the risk of drowning for their children, and their supervisory behaviours.

Introductory questions sought demographic information on gender, ethnicity, and frequency of visits to the beach where interviewed. The survey included questions that required yes/no responses as to whether respondents could swim, had received rescue training, and whether they were certified in CPR. Follow-up questions asked caregivers how they felt about

performing these tasks using four response categories: very comfortable, comfortable, anxious, and very anxious. Similar questions and response categories had previously been used in a study of young adults' water safety behaviour in Dunedin, New Zealand (Gulliver & Begg, 2005). Using two age groupings of under 5 years and 5–9 year olds, respondents were asked to describe their child's swimming ability using four categories: non-swimmer, weak swimmer, good swimmer, and don't know. Two questions focused on perceptions of the risk of drowning for their child/children at the beach on the day of the survey using five categories: extremely risky, very risky, slightly risky, no risk, and don't know. Three concluding questions sought information on parental/caregiver perceptions of water safety supervision of children at the beach.

### Procedures

A team of research assistants ( $n = 3$ ) was trained to conduct all aspects of the fieldwork process from data collection to data inputting. To ensure consistent and accurate inputting of the data, one assistant with data handling experience took responsibility for inputting all data received from the completed surveys. The two other research assistants assigned to collect data on the beaches had experience of dealing with the public through their professional teaching and medical training and, in addition, both had extensive knowledge of beach safety from their considerable surf-lifesaving experience.

Prior to the main study, the data gathering process was trialled with the research team working together on beaches to ensure consistency of data gathering procedures. Interviewers were trained to initially observe adult beachgoers' arrival at the beach, note the composition of their social group and the number of children estimated to be less than 10 years of age in their charge. They were also trained to approach adult beachgoers on the beach and invite them to participate in an anonymous survey about beach water safety. Questionnaires were systematically distributed along successive sections of the beach and collected from participants shortly after completion.

### Data analysis

Data from the completed questionnaires were entered into Microsoft Excel X for statistical analysis using SPSS Version 15.0 in Windows. Frequencies and percentages were used to report on the socio-demographic differences in estimates of adult and child swimming competencies, supervisory behaviour, and risk perception. Chi-squared statistics were used to test the associations between independent variables (such

as gender and ethnicity) and dependent variables (such as drowning risk and supervisory practice).

### Results

Of the 865 adult beachgoers invited to participate in the study, a sample of 769 completed the survey, a response rate of 89%. Of these, 58% were females, and 64% of the sample self-identified as European, 14% as Maori, 5% as Pacific Island people, 5% as Asian people, and 13% as being from 'other' ethnic groups. Most of the caregivers identified themselves as parents (85%;  $n = 643$ ) in charge of 1578 children (under 5s = 703, 5–9 year olds = 875). Most surveys were completed at surf beaches (63%;  $n = 483$ ). For one fifth (19%;  $n = 142$ ) of respondents, it was their first visit to the beach where they were interviewed. Of the 528 social groups identified in the survey, most participants were either in one caregiver/two or more children groups (32%;  $n = 170$ ) or in two caregiver/two or more children groups (30%;  $n = 159$ ).

### Practical water safety competencies

Most parents/caregivers (78%;  $n = 603$ ) estimated that they could swim 100 m non-stop in open water, although more than one third (35%;  $n = 269$ ) reported being anxious/very anxious about completing this task. Although most (90%;  $n = 694$ ) reported that they could float in deep water 20 m offshore without support, one third (33%;  $n = 251$ ) felt anxious/very anxious about performing this task. Slightly less than half (48%;  $n = 370$ ) reported that they had been certified in cardio-pulmonary resuscitation (CPR) and more than three quarters (76%;  $n = 582$ ) had not received any rescue/lifesaving training.

Considerable differences were evident when water safety skills were analysed by gender (Table 1). Significantly more males than females estimated that they could swim 100 m non-stop in open water ( $\chi^2 [1, N = 769] = 35.868, p \leq 0.001$ ). Almost half (47%;  $n = 210$ ) of the females surveyed felt anxious/very anxious about their swimming ability compared with less than one fifth of males (18%;  $n = 59$ ). Gender differences were evident also in self-estimated flotation ability with significantly more males ( $\chi^2 [1, N = 769] = 9.749, p \leq 0.002$ ) estimating that they could float in deep water 20 m offshore without support. More than half of females (52%;  $n = 189$ ) compared with less than one fifth of males (19%;  $n = 62$ ) felt anxious/very anxious about having to perform this task in open water ( $\chi^2 [3, N = 769] = 80.539, p \leq 0.001$ ).

Approximately half of Pacific Islands (44%) and Asian (54%) respondents compared with one fifth of

Table 1. Self-estimated water safety skills of parents/caregivers by gender.

	Males <i>n</i> (%)	Females <i>n</i> (%)	$\chi^2$	<i>p</i>
Swim 100 m non-stop in open water?				
Yes	287 (89%)	316 (71%)	35.868	<0.001
No	36 (11%)	130 (29%)		
How do you feel about this swimming task?				
Very comfortable	127 (39%)	93 (21%)	77.120	<0.001
Comfortable	137 (42%)	143 (32%)		
Anxious	55 (17%)	163 (37%)		
Very anxious	4 (1%)	47 (11%)		
Stay afloat in deep water 20 m offshore without support?				
Yes	304 (94%)	390 (87%)	9.749	0.002
No	19 (6%)	56 (13%)		
How do you feel about this floating task?				
Very comfortable	149 (46%)	82 (18%)	80.539	<0.001
Comfortable	112 (35%)	175 (39%)		
Anxious	48 (15%)	135 (30%)		
Very anxious	14 (4%)	54 (12%)		
Have you been certified in CPR?				
Yes	141 (44%)	229 (51%)	4.440	0.035
No	182 (56%)	217 (49%)		
Have you had rescue/lifesaving training?				
Yes	86 (27%)	101 (23%)	1.612	0.204
No	237 (73%)	345 (77%)		
Total	323 (100%)	446 (100%)		

European (17%) and Maori (19%) caregivers reported that they were unable to swim 100 m non-stop in open water. Asian caregivers were most likely (43%), European (6%) and Maori (5%) least likely, to report not being able to float in deep water offshore. European caregivers were most likely (54%) and Asian caregivers least likely (14%) to have acquired CPR certification. No significant differences in self-estimated swimming-related competencies were found between beachgoers surveyed at surf or flat-water beaches.

#### ***Parent/caregiver perceptions of their child's swimming ability and risk of drowning***

Most caregivers (64%;  $n = 294$ ) considered their under 5-year olds to be weak or non-swimmers and more than a third (39%;  $n = 199$ ) considered their 5–9 years olds to be weak or non-swimmers. No significant differences were reported in male/female caregiver estimations of swimming ability for the under 5's, but significantly more males estimated higher swimming ability for their 5–9 year-old children ( $\chi^2 [3, N = 769] = 12.570, p = 0.006$ ).

Most caregivers considered that there was slight or no risk of drowning for their under 5-year olds (60%;  $n = 276$ ) or for their 5–9 year olds (82%;  $n = 415$ ). One fifth of caregivers considered it to be extremely risky (20%;  $n = 92$ ) or very risky (19%;  $n = 87$ ) for

their under 5-year olds, but a much smaller proportion considered it to be extremely risky (6%;  $n = 29$ ) or very risky (10%;  $n = 52$ ) for their 5–9 years olds. No significant difference was found between male and female estimates of risk to their under 5-year olds, but significant differences were evident for the older age group ( $\chi^2 [4, N = 463] = 26.347, p \leq 0.001$ ), with twice as many males than females likely to estimate no risk (males 37%, females 18%).

#### ***Parent/caregiver perceptions of supervision of their child's water safety at the beach***

Table 2 shows the self-reported supervisory behaviours that caregivers engage in when their children are playing in the water. For the under 5-year olds, most parents reported that they stay close to their children in the water (71%;  $n = 326$ ). Almost one quarter of parents/caregivers reported that they watched constantly from the beach (23%;  $n = 107$ ). For the older 5–9 years age group, the pattern of supervision changed with watching them constantly from the beach being the most frequently reported supervisory behaviour (46%;  $n = 232$ ), followed by staying close to them in the water (43%;  $n = 216$ ).

No significant differences in supervisory behaviour were found when supervising either of the age groups was analysed by gender, ethnicity, or beach type (flat-water or surf beach). The behaviour shift from staying

close to them in the water to watching them constantly from the beach in the older age group was consistent across gender, ethnicity, and beach type.

#### **Parent/caregiver perception of who is responsible for child water safety at beaches**

Two thirds (66%;  $n = 504$ ) of participants believed that the parent/caregiver was best able to provide supervision and slightly less than a quarter believed that lifeguards were best able to supervise their children (22%;  $n = 172$ ). One tenth of participants believed supervision was best carried out by adults close to them in the water (10%;  $n = 80$ ). When perceptions of supervisory roles were analysed by gender, considerable differences in opinions were evident between males and females. Table 3 shows that more females believed that the role of water safety supervisor was best filled by parents/caregivers (females 72%, males 57%). More males than females thought that either lifeguards (males 28%, females 19%) or other adults close to them in the water (males 13%, females 8%) were best able to supervise their children's water activity.

Fewer Pacific Islands and Asian than European, Maori and 'other' ethnicities respondents thought that parents/caregivers were best able to supervise their children when in the water at the beach (47 and 41% compared with 69, 62, and 67%, respectively). One

quarter (27%) of Asian parents/caregivers believed that other adults closest to their children in the water were best able to supervise their water safety.

#### **Discussion**

The results of this study suggest that parent/caregiver water safety supervision and perceptions of child drowning risk vary considerably within the beach-going public. It is a cause for concern that more than one quarter (29%) of adults reported that they did not stay close in the water to their younger children (<5 years) and almost half (46%) reported watching their 5–9 year olds constantly from the beach rather than from the water. The shift in caregiver supervisory behaviour for the older age group is especially worrying given that childhood drowning incidence in open water increases with age (CYMRC, 2005). Corroboration of a lack of close supervision was affirmed in another part of this study (and reported elsewhere, Moran, 2007) where observation of supervision indicated that one quarter (24%) of caregivers failed to provide appropriate supervision when their children were playing in the water. Given that almost half (44%) of the caregivers were not frequent visitors to the beach where they were interviewed (<5 visits), perhaps many were unaware of potential dangers and the need for caution when their young children were in the water.

Table 2. Parent/caregiver self-reported supervisory behaviour.

	Under 5 years		5–9 years	
	<i>n</i>	%	<i>n</i>	%
Which action best describes what you do when your children are in the water?				
Stay close to them in the water	326	71	216	43
Watch constantly from the beach	107	23	232	46
Tell them not to go out too deep	12	3	38	8
Make sure older children are with them	1	0.2	9	2
Other	15	3	13	3
Total	464	(100%)	508	100

Table 3. Gender differences in parent/caregiver perceptions of who is best able to supervise children's water activity at the beach.

	Males <i>n</i> (%)	Females <i>n</i> (%)	$\chi^2$	<i>p</i>
Who is best able to supervise your child/children in the water?				
Parents/caregivers	183 (57%)	321 (72%)	20.387	<0.001
Lifeguards	89 (28%)	83 (19%)		
Adults nearest them in the water	43 (13%)	37 (8%)		
Older responsible children	4 (1%)	3 (1%)		
Other children with them	3 (1%)	1 (0.1%)		
Total	322 (100%)	445 (100%)		

Important gender differences that may impact on the quality of water safety care provided by caregivers were also found. Males were more likely than females to report confidence in their own swimming ability – findings that affirm those reported in previous studies by Moran (2008) with youth, Gulliver and Begg (2005) with young adults, and McCool, Moran, Ameratunga, and Robinson (2008) with adults. Whether this confidence in swimming ability is real or imagined and whether superior caregiver swimming skill might provide children with greater protection in an emergency is not known. Some suggestion of male overestimation of water safety ability is, however, indicated in the responses to questions on rescue ability where males were more confident of their ability to rescue their child even though they reported no more lifesaving training than females that took part in the study.

Gender differences in caregiver estimation of child swimming ability and risk of drowning may also influence the adequacy of parental/caregiver supervision. Although no significant gender differences were found in estimates of swimming ability or risk of drowning for the under 5-year olds, male caregivers reported higher estimates of competency among their 5–9 year olds. Higher estimation of a child's swimming ability may reduce the level of attention paid by males when supervising their children at the beach. In addition, male estimates of risk of drowning for their 5–9 year olds also differed significantly from that of females, with twice as many males reporting no risk at the beach on the day of the survey (males 37%, females 18%). This may be indicative of a tendency for male caregivers to underestimate child drowning risk, a finding that is consistent with other studies that have found a male propensity to underestimate personal risk of drowning (Howland, Hingson, Mangione, Bell, & Bak, 1996; McCool et al., 2008; Moran, 2006). The implication of this on young children's water safety is that male caregivers may not provide close and constant supervision of young children in the water at the beach in the mistaken belief that conditions are not potentially dangerous. Furthermore, while two thirds of respondents (66%) rightly considered the parent/caregiver to be the best supervisor, more males thought that supervision of their child was the responsibility of others, including lifeguards (males 28%, females 19%) or adults close by in the water (males 13%, females 8%) – an abdication of responsibility that may place undue demands on lifeguards and members of the public alike.

Although ethnicity did not influence water safety supervision to the same extent as gender, some important differences were evident between ethnic groups. Notably, caregivers from European, Maori,

and 'other' ethnic backgrounds reported better personal swimming-related competencies than Pacific Islands and Asian parents/caregivers. European, Maori, and 'other' groups also reported better swimming ability among their children. This may place children from Asian and Pacific Islands social groups at greater risk at the beach because of reduced adult and child ability to cope with unintentional submersion or hazardous water conditions. It may, on the other hand, make them more risk averse and unlikely to take the risks that more confident children and caregivers may find acceptable. Further study is required to substantiate or refute such speculation.

The results should be considered in respect of several methodological limitations. Firstly, the sample did not include parents/caregivers who take young children to the beach outside peak hours or during weekdays that were not public holidays. Secondly, even though frequently used in health behaviour research, the reliance on self-reporting risk behaviours (such as supervisory behaviour) can result in some measurement error (Robertson, 1992). Thirdly, the sample population varied from the national population demographics with more females and fewer Pacific Islands and Asian people taking part in the study. Finally, given the cross-sectional design, the associations observed in this study cannot be assumed to be either causal or predictive of safe or unsafe caregiver supervisory behaviour at the beach. These limitations notwithstanding the findings do provide evidence of questionable supervisory practice and caregiver misconceptions of their critical role in supervising children's water activity at the beach. Further research is required to corroborate these findings in other open water settings such as lakes and rivers.

## Conclusion

This is the first study of its kind to identify a lack of caregiver water safety supervision at beaches and a misplaced shift in supervisory behaviour with age that may place vulnerable youngsters at risk of drowning. It also suggests some ambiguity among caregivers about their responsibilities to protect their young children when in the water at the beach. To counter any misconceptions among parents/caregivers, especially males, of their essential role in providing the first layer of water safety protection for their young children at the beach, water safety education initiatives emphasising the importance of supervision of young children at beaches need to be promoted. In addition, specific supervisory strategies need to focus on the necessity for caution when estimating caregiver and children's ability to cope with open water conditions and the subsequent need to provide close and constant

supervision for all young children playing in water at the beach.

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