

Self-Estimates of Swimming and Rescue Competence, and the Perceptions of the Risk of Drowning among Minority Groups in New Zealand – Life Saving or Life Threatening?

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Abstract

Analysis of drowning and rescue statistics suggests that some population groups (such as males, youth, and minority groups) are at greater risk than others. This study reports on the perceived water competency of minority groups, and its potential to mitigate the risk of drowning when swimming in open water. Of the 194 Maori and Pasifika adults that took part in the study, most (91%) believed they could swim, and over two-thirds (70%) considered their competence to be *good/very good*, although most (72%) estimated they could swim 25m or less. Most participants reported undesirable attitudes which could account for the over-representation of these minority groups in drowning statistics. Significant gender differences were evident for all risk perceptions. This study suggests that males from disadvantaged lower SES minority groups may be at greater risk of drowning because of their lack of competency and their tendency to overestimate this, with regard to swimming and rescue competence in open water environments.

Keywords: Drowning prevention, water safety, minority groups, swimming competency, risk perception

Introduction

Analysis of mortality statistics worldwide suggests that minority groups, especially those of lower socio-economic status, are at greater risk of premature death from non-communicable diseases such as drowning (Tobias, 2017; Stringini et al., 2017). While the circumstances surrounding drowning incidents have been well reported (Martyn, 2014a; Martyn, 2014b), little is known about what competencies, physical and cognitive, people from low socio-economic minority groups bring to the aquatic environment, or what knowledge informs their judgement of safety and risk (Quan, 2014; Shaw, Blakely, Crampton, & Atkinson, 2005; Petridou & Tursz, 2001). Further, it is unknown if they, or any other groups, can accurately assess their own competency in open water when confronted with exacerbating environmental factors (such as cold, waves and currents), or when engaged in high risk activities (such as rock-based fishing or boating). It is the purpose of this study to explore the self-estimated swimming and rescue competencies, and the perceived risk of drowning, of low socio-economic status minority groups with particular reference to open water environments where most drowning occurs. Three key demographic factors appear to influence drowning mortality and morbidity— gender, ethnicity, and socio-economic status. Males comprise 49% of the New Zealand population (Statistics NZ, 2016), yet account for 80% of the drowning fatalities (Water Safety New Zealand [WSNZ], 2016). Similar overrepresentation of males in drowning statistics has been previously reported (Smith & Brenner, 1995; Langley, Warner, Smith, & Wright, 2001; Gulliver & Begg, 2005; Howland, Hingson, Mangione, Bell, & Bak, 1996; Moran, 2009b).

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In a study on the perception of swimming competence and risk of drowning of parents and their children (Stanley & Moran, 2017), males were twice as likely as females (22% vs. 11%) to estimate they could swim more than 200m, and more likely to feel safe when swimming in open water (76% vs. 57%). Male parents were more likely to express confidence in their swimming competency, whereas female parents were more likely to report positive water safety attitudes. Furthermore, a previous study by the authors reported male overestimation extended to perceived rescue competency in open water (Moran & Stanley, 2013).

Some evidence suggests that ethnic minorities (Mael, 1995; McCool, Ameratunga, Moran, & Robinson, 2009; Quan, Crispin, Bennett, & Gomez, 2006), and those of lower socio-economic status (Hong, Lee, Ha, & Park, 2010; Rahman, Giasuddin, Svanström, & Rahman, 2006; Huong, Van Minh, Janlert, & Byass, 2006; Shaw et al., 2005; Petridou & Tursz, 2001; Cubbin, LeClere, & Smith, 2000) are at greater risk of drowning. In New Zealand, two of the ethnic groups identified as being overrepresented in drowning statistics are Maori and people from the Pacific Islands. Maori, the indigenous people of New Zealand, comprise 15% of the total population (Statistics NZ, 2016) yet account for 21% of the annual drowning toll (WSNZ, 2016). Pacific peoples (hereafter referred to as Pasifika) comprise 7% of the population (Statistics NZ, 2016) and account for 8% of the annual drowning toll (WSNZ, 2016).

Maori and Pasifika have been identified in New Zealand as of lower socio-economic status (Marriott & Sim, 2014; Pollock, 2012; Statistics NZ, 2013), with increasing inequality over the past decade (Marriott & Sim, 2014; Statistics NZ, 2013; Statistics NZ, 2016). In addition, Maori and Pasifika have reported lower participation in aquatic activity. Sport New Zealand (2015) has linked groups of low socio-economic deprivation with less participation in all sport or recreation, including swimming. Swimming is the second most popular recreational activity with almost one third (30%) of New Zealanders having participated in swimming in the previous year (Sport NZ, 2015). Lower participation in swimming was reported for those of lower socio-economic status (high SES 33.5%, low SES 26.7%), and Maori (27.8%) and Pasifika (20.4%). Furthermore, the study found that lower socio-economic groups were more likely to take part in activities in natural settings, which, for aquatic pursuits, means the open water where most drowning fatalities occur (WSNZ, 2016). Evidence also suggests differences in perception of water competency are apparent for both socio-economic status and ethnicity among youth (Moran, 2006; Moran, 2008a). Students from low socio-economic status schools estimated significantly lower swimming competence than their peers from higher socio-economic status schools, and fewer Maori (44%) and Pasifika (27%) youth than European youth (53%), estimated being able to swim more than 100m.

Differences in perceived water competencies by gender, socio-economic status, and ethnicity reported above, led the authors to focus on Maori and Pasifika males because they are overrepresented in the drowning statistics. In addition, little is known about how these high risk groups perceive their risk of drowning and their perceived capacity to cope with that risk. The research questions that underpin this study therefore focus on the perceptions of swimming and rescue competency and the risk of drowning in an adult Maori and Pasifika population, by exploring:

- perceived swimming competency in closed and open water,
- perceived rescue competency in open water,
- perceptions of the risk associated with various open water scenarios, and
- water safety attitudes in relation to open water environments.

Method

This study used a cross-sectional design with self-complete written survey methodology. Adult members of the workforce from 12 manufacturing organisations in South Auckland, New Zealand were invited to take part in the study during the 2013/2014 summer. South Auckland was chosen because it is a recognised area of low socio-economic status (Department of Public Health, 2014) with a high Maori/Pasifika population (Auckland Council, 2013). Manufacturing workplaces were selected because of their high number of Maori and Pasifika employees, ethnicities with high representation in injury data, including drowning. The organisations completed an employer sponsored health and safety program with water safety being one of the components. Research ethics approval was obtained from The University of Auckland Human Participants Ethics Committee (AUHPEC) (Reference number 10065).

Participants

A total of 221 employees in 12 workplaces completed the self-complete written questionnaire after a brief water safety presentation (approximately 30 minutes) as part of an employee health and safety initiative. From this workforce, responses from Maori and Pasifika employees ($N = 194$) were selected for analysis.

Survey Instrument

The survey was designed to be completed in about 10 minutes during the series of presentations that related to water safety. The questionnaire consisted of 14 closed questions based on previously validated studies (Moran, 2003; Moran, 2006; Moran, 2008b; McCool et al., 2009; Moran & Stanley, 2013). The first four questions assessed socio-demographic characteristics including gender, age (*15–19 years, 20–29 years, 30–44 years, 45–64 years, 65+ years*), self-identified ethnicity (*New Zealand European, Maori, Pasifika, Asian, and “other” ethnic groups*), and length of residency (*<1 year, 1–4 years, 5–9 years, >10 years*).

Five questions sought information on swimming competency by asking participants whether they could swim and, if so, how they would rate their swimming competency using four response categories (*poor, fair, good, very good*), and how far they estimated could swim non-stop (Moran, 2003). In addition, information was sought on when and where they had swum the distance (*last month, last year, last 5 years, last 10 years*), how easily they thought they could swim the distance estimated in open water (*very easily, easily, with difficulty, with great difficulty*), and how often they swum in open water (*daily, weekly, about once a month, less than once a month, never*).

Participants were also asked if they thought they could rescue someone in open water, and, if so, how easily (*very easily, easily, with difficulty, with great difficulty*) (Moran & Stanley, 2013). To determine water safety attitudes, participants were asked a series of six statements (Q. 12) using a three-point response scale of *agree, disagree, and unsure* (Moran 2008b, McCool et al., 2009). A series of 10 statements (Q. 13) designed to ascertain their estimated water competency in open water used a three-point response scale of *confident, anxious, and unsure*. Finally, perception of the risk of drowning was determined using a series of five statements (Q.14) (for example, when being caught in a rip current at a surf beach or being swept off isolated rocks by a wave while fishing) with a four-point response scale (*extreme risk, high risk, slight risk, no risk*) (Moran, 2008b, Moran et al., 2012).

Data analysis

All data was entered into SPSS Statistics Version 22 (Armonk, NY, USA) for statistical analysis. Frequency and percentages were generated to report categorical variables such as demographic data and perceptions of competence and risk. Chi-square tests were used to determine the association between dependent variables (such as perceived swimming competency and risk) and independent variables (such as gender, age, and ethnicity). Where multiple responses were included (for example, swimming and rescue competency), results were dichotomized for ease of interpretation with *poor* and *fair* grouped as *poor/fair*, and *good* and *very good* grouped as *good/very good*.

Results

A total of 194 employees who self-identified as Maori or Pasifika participated in the study. Most were male (80%, $n = 156$), had lived in New Zealand for 10 years or longer (80%, $n = 157$), and were aged between 20–64 years (20–29 years 28%, 30–44 years 34%, 45–64 years 30%). Three-quarters (75%, $n = 145$) self-identified as Pasifika with the remaining participants self-identifying as Maori (25%, $n = 49$). No significant differences were found in competency estimates or perception of risk when analysed by age groups or length of residency in New Zealand and therefore results are tabulated by gender which did show significant variability.

Self-estimated swimming and rescue competency

Table 1 shows self-estimated swimming and rescue competency by gender. Most participants (91%) believed they could swim, and over two-thirds (70%) considered their competence to be *good/very good*, although most (72%) estimated they could swim 25m or less.

Table 1. Self-Estimated Swimming and Rescue Competency in Open Water by Gender

	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Estimated swimming competency						
Good/Very good	114	73.1%	22	57.9%	136	70.1%
Poor/Fair/Cannot swim	42	26.9%	16	42.1%	58	29.9%
Estimated swimming distance*						
25 m or less	107	68.6%	33	86.8%	140	72.2%
More than 25 m	49	31.4%	5	13.2%	54	27.8%
Swum distance in open water*						
In open water	114	73.1%	15	39.5%	129	66.5%
Not in open water	42	26.9%	23	60.5%	65	33.5%
Could rescue in open water*						
Yes	101	64.7%	16	42.1%	117	60.3%
No	55	35.3%	22	57.9%	77	39.7%
Rescue confidence in open water*						
Easily/ Very easily	89	57.1%	8	21.1%	97	50.0%
With difficulty/ With great difficulty / Could not rescue	67	42.9%	30	78.9%	97	50.0%

*Significant difference between males and females ($p < .05$)

While no significant gender difference was found in competency estimates (see Table 1), significantly more males ($\chi^2(1) = 5.068, p = 0.024$) estimated they could swim more than 25m (31% vs. 13%). Female (87%) participants were more likely to estimate a swimming distance of less than 25m. Two thirds (66%) of participants reported they had swum the distance in deep, open water. Significantly more males than females (73% vs. 40%) recounted having swum their estimated swimming distance in open water ($\chi^2(1) = 15.487, p \leq 0.001$). Most participants (60%) thought they could rescue someone in open water, and one half (50%) believed they could perform a rescue with ease. When analysed by gender, significantly more males than females (64% vs. 42%) were confident of their ability to rescue ($\chi^2(1) = 6.542, p = 0.011$). Almost all males and very few females (92% vs. 8%) thought that they could perform a rescue with ease ($\chi^2(1) = 15.839, p < 0.001$).

Water safety attitudes

Participants were asked to respond to six statements about their attitudes to water safety (see Table 2). Almost three quarters (73%) of participants believed their swimming ability would keep them safe when swimming in open water, and, although not significant ($\chi^2(2) = 5.752, p = 0.056$), more males than females (76% vs. 58%) were confident that their swimming capacity would be protective in a drowning emergency.

Table 2. Water Safety Attitudes by Gender

	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
My swimming ability will keep me safe when swimming in open water						
Agree	119	76.3%	22	57.9%	141	72.7%
Disagree	22	14.1%	11	28.9%	33	17.0%
Unsure	15	9.6%	5	13.2%	20	10.3%
My current swimming fitness will ensure my safety in open water						
Agree	100	64.1%	19	50.0%	119	61.3%
Disagree	34	21.8%	11	28.9%	45	23.2%
Unsure	22	14.1%	8	21.1%	30	15.5%
The risk of drowning is always in the back of my mind when swimming in open water						
Agree	100	64.1%	24	63.2%	124	63.9%
Disagree	32	20.5%	9	23.7%	41	21.1%

Unsure	24	15.4%	5	13.2%	29	14.9%
Others are at greater risk than me when swimming in open water*						
Agree	96	61.5%	12	31.6%	108	55.7%
Disagree	36	23.1%	18	47.4%	54	27.8%
Unsure	24	15.4%	8	21.1%	32	16.5%
I often feel at risk swimming when conditions are rough*						
Agree	47	30.1%	27	71.1%	74	38.1%
Disagree	88	56.4%	8	21.1%	96	49.5%
Unsure	21	13.5%	3	7.9%	24	12.4%
My swimming ability means I don't need to wear a lifejacket in a boat						
Agree	32	20.5%	3	7.9%	35	18.0%
Disagree	108	69.2%	32	84.2%	140	72.2%
Unsure	16	10.3%	3	7.9%	19	9.8%

*Significant difference between males and females ($p < 0.05$)

More than one half (56%) of participants agreed that others were at a greater risk of drowning than themselves, and significantly more males than females (62% vs. 32%) believed they were safe when swimming in open water ($\chi^2(2) = 12.000, p = 0.002$). Almost two thirds (61%) of respondents had faith in their swimming fitness to ensure their safety in open water, although a similar percentage (64%) reported the risk of drowning was always present when swimming in open water. Almost one fifth (18%) of participants believed that their swimming ability was good enough to not require the wearing of a lifejacket in a boat, and, although not significant ($\chi^2(2) = 3.821, p = 0.148$), more males than females (21% vs. 8%) reported unsafe attitudes towards the wearing of lifejackets. Over one third of respondents (38%) agreed that they often felt at risk swimming in rough conditions with significantly more females than males (71% vs. 30%) feeling at risk in rough conditions ($\chi^2(2) = 21.902, p \leq 0.001$).

Open Water Confidence

Table 3 shows the confidence of participants in open water by gender. One half of respondents felt confident about going to help someone in open water (52%), swimming in deep, open water (51%), swimming at a beach without lifeguard supervision (50%), or swimming on their back in open water (48%).

Table 3. Open Water Confidence by Gender

	Confident		Anxious		Unsure	
	Male n/%	Female n/%	Male n/%	Female n/%	Male n/%	Female n/%
Going to help someone in open water	86 (55.1%)	15 (39.5%)	31 (19.9%)	12 (31.6%)	39 (25.0%)	11 (28.9%)
Swimming in open water out of my depth*	91 (58.3%)	8 (21.1%)	30 (19.2%)	19 (50.0%)	35 (22.4%)	11 (28.9%)
Swimming without lifeguard supervision at a beach*	84 (53.8%)	12 (31.6%)	41 (26.3%)	18 (47.4%)	31 (19.9%)	8 (21.1%)
Swimming on my back in open water	79 (50.6%)	14 (36.8%)	45 (28.8%)	12 (31.6%)	32 (20.5%)	12 (31.6%)
Swimming in waves	69 (44.2%)	11 (28.9%)	48 (30.8%)	15 (39.5%)	39 (25.0%)	12 (31.6%)
Swimming in cold water*	67 (42.9%)	7 (18.4%)	54 (34.6%)	20 (52.6%)	35 (22.4%)	11 (28.9%)
Swimming in rough water*	62 (39.7%)	6 (15.8%)	54 (34.6%)	20 (52.6%)	40 (25.6%)	12 (31.6%)

*Significant difference between males and females ($p < .05$)

Significantly more males than females (58% vs. 21%) reported confidence in deep water ($\chi^2(2) = 20.322, p \leq 0.001$), and more males than females (54% vs. 32%) were confident about swimming without lifeguard supervision at a beach ($\chi^2(2) = 7.550, p = 0.023$).

Participants were less confident of swimming in rough water (35%), cold water (38%), and waves (41%), although significantly more males than females reported confidence in rough water (40% vs. 16%) ($\chi^2(2) = 8.004, p = 0.018$) and swimming in cold water (43% vs. 18%) ($\chi^2(2) = 7.966, p = 0.019$).

Perception of Risk of Drowning

Most respondents rated the risk to drowning as *extreme* or *high* for being swept off isolated rocks while fishing (86%) and being caught in a rip at a surf beach (73%), and over one half believed the risk of drowning was *extreme* or *high* for being tipped out of a canoe off-shore (55%) or falling into a river fully clothed (53%). As expected, most participants rated the risk of drowning as *slight* or *no risk* when chasing an inflatable toy into a pool (88%).

Table 4. Perception of Risk of Drowning by Gender

	Extreme / High Risk		Slight / No Risk	
	Male n/%	Female n/%	Male n/%	Female n/%
Swept off isolated rocks by a wave while fishing*	130 (83.3%)	37 (97.4%)	26 (16.7%)	1 (2.6%)
Caught in a rip current at a surf beach*	107 (68.6%)	35 (92.1%)	49 (31.4%)	3 (7.9%)
Tipped upside down in a canoe 100 metres from the shore of a lake*	76 (48.6%)	31 (81.6%)	80 (51.3%)	7 (18.4%)
Fell into deep water fully clothed while walking along a river bank*	73 (46.8%)	31 (81.6%)	83 (53.2%)	7 (18.4%)
Chased inflatable toy into deep water at a local swimming pool*	12 (7.7%)	12 (31.6%)	144 (92.3%)	26 (68.4%)

*Significant difference between males and females ($p < .05$)

Significant gender differences were evident for all risk perceptions (see Table 4). Females perceived the risks to be higher than males for being swept off rocks (97% vs. 83%) ($\chi^2(1) = 5.024, p = 0.025$), getting caught in a rip (92% vs. 69%) ($\chi^2(1) = 8.612, p = 0.003$), tipping out of a canoe (82% vs. 49%) ($\chi^2(1) = 13.340, p \leq 0.001$), and falling clothed into a river (82% vs. 47%) ($\chi^2(1) = 14.866, p \leq 0.001$). Even in the least dangerous activity, that of chasing a toy into the deep end of a pool, significantly more females than males (32% vs. 8%) considered this to be a high risk activity ($\chi^2(1) = 16.083, p \leq 0.001$).

Discussion

The primary purpose of this paper was to explore the self-estimated perceptions of swimming and rescue competency and perceptions of the risk of drowning in open water among a group of Maori and Pasifika adults who are overrepresented in New Zealand drowning statistics. Swimming competence has traditionally been regarded critical in drowning prevention although other competencies such as water safety skills and knowledge are now accepted among water safety experts as being just as critical (Moran, 2013; Stallman, Moran, Langendorfer & Quan, 2017). Most participants (91%) thought they could swim, and most (70%) considered themselves to be *good/very good* swimmers, even though most estimated that they could only swim 25m or less, a swimming distance that is unlikely to afford a great deal of protection in many open water environments as previously reported (Stanley & Moran, 2017; Moran & Stanley, 2013).

Males were twice as likely as females (31% vs. 13%) to estimate that they could swim more than 25m, and females were more likely to estimate they could swim less than 25m (87% vs. 69%). A previous study on parental perceptions of swimming competency by the authors (Stanley & Moran, 2017) found that parents who identified as being European were less likely to estimate a lower swimming competence than non-European parents (29% vs. 67% able to swim less than 25m), and more likely to indicate their children could swim more than 50m (27% vs 9%). Maori and Pasifika are less likely to have been formally taught swimming via private swimming lessons or be taught aquatics in schools as children (Moran, 2009b). They may not have had the opportunity to develop water competencies in adulthood making the accurate estimation of competency problematic. The provision of affordable lessons for minority groups may facilitate enhanced water competency and more realistic estimation of its protective effect in preventing drowning.

As was the case with self-estimated swimming competency, estimates of rescue competency appeared to be optimistic among participants in this study. One half of all participants believed they could complete a rescue with ease, with males more confident in their ability to perform a rescue with ease. Previous studies have shown rescue competence is related to gender, socio-economic status, and ethnicity (Moran, 2008a; Franklin & Pearn, 2011; Moran & Stanley, 2013; Moran, Webber & Stanley, 2016). A study of respondents attending a multicultural festival in Auckland found that most males would jump in to save someone (55%) and most females would seek the help of lifeguards (65%) (Moran & Stanley, 2013). A recent study of parents with children at in-water aquatic lessons reported that significantly more males were confident in their ability to perform a rescue (63% males vs. 27% females) (Moran et al., 2016). These results indicate the differences between genders for confidence may be wider for Maori and Pasifika groups. This overconfidence may predispose their overrepresentation in the rescuer drowning statistics (Moran & Stanley, 2013).

A fundamental issue with the reliance upon swimming competency in the prevention of drowning is the transference of swimming competency to the open water environment. Maori and Pasifika adults were more likely to have completed their estimated swimming distance in open water (66%) than reported in an earlier study of parents (41%) (Stanley & Moran, 2017). This may be a reflection of a greater prevalence among lower socio-economic groups to take part in activities in natural settings (Sport NZ, 2015), an aquatic environment where most drowning fatalities occur. Males and Maori were more likely to have swum in open water. Reasons for this may be the greater likelihood of male exposure to aquatic activity (Howland et al., 1996) or the cultural importance of gathering seafood (*kaimoana*) for Maori. Further research is required to see if their perceived swimming and rescue competence matches real competence in the open water.

Many participants in the study reported unsafe attitudes towards swimming in open water (see Table 2). In spite of low self-estimations of distance swum, most believed their swimming competency would keep them safe in open water, most felt safe swimming in rough water, and most believed that others were more at risk than themselves. Males were more likely to estimate greater swimming distance, believe that others were more at risk than themselves, and that their swimming ability was good enough to not require the wearing of a lifejacket in a boat. Participants in this study reported more unsafe attitudes than parents who took part in a similar study on open water risk of drowning (Stanley & Moran, 2017). Males in this study also expressed confidence in their behaviours in open water, reporting greater confidence than females in their ability to swim without lifeguard supervision at a beach, to swim in rough water, or in deep open water. To change unsound attitudes and behaviours, specifically targeted water safety programmes could be promoted at school and community level where these minority groups are easily accessed.

Potential overestimation of competency has also been linked to the risk of drowning (Moran et al., 2012; Stallman, 2011; Petrass, Blitvich, McElroy, Harvey, & Moran, 2012; Kjendlie et al., 2013). Most respondents in this study were correctly able to recognise the high risk scenarios around open water. Males reported a lesser severity of risk in the most extreme risk settings, that of being swept off rocks when fishing (83% vs. 97%) or getting caught in a rip current (67% vs. 92%). Such gender differences in drowning risk perceptions suggest that males from minority groups are more likely to be risk takers in the aquatic environment while females from the same background are more likely to be risk averse. Similar findings of male underestimation of risk have been previously reported (Gulliver & Begg, 2005; Moran, 2006; Moran, 2009a; Moran 2009b). One possible reason for the male underestimation of risk may be the reported lesser water safety knowledge for male Maori/Pasifika youth (Moran, 2007), and other ethnic minorities (Moran 2006; Moran & Willcox, 2010; Moran & Willcox, 2013), which may influence their perception of risk. Education programmes that promote accurate risk assessment and risk management processes may help counter this widely accepted notion of male underestimation of risk.

Limitations

Overall, results from this study provide useful insight into why minority groups in New Zealand are at greater risk of drowning and over-represented in drowning statistics. The results should be treated with some caution in light of several methodological limitations. First, the data were obtained from a convenience sample of adult members of the workforce at 12 selected work places, identified because of their high number of Maori and Pasifika employees. As a consequence, the sample population varied from the national population demographics with more males and more Pasifika taking part in the study. Second, information wasn't sought from individuals on their socio-economic status, this was assumed from their area of employment together with their ethnicity.

Third, although often used in water safety research, self-reporting of swimming competence can result in measurement error and might not accurately express true competence (Robertson, 1992; Mickalide, 1997; Watson, Kendrick & Coupland, 2003). Fourth, no explanation of swimming competency in relation to drowning prevention was given to respondents which may have led to vagueness in responses. Fifth, the questionnaire was completed at the end of a water safety presentation, which may have influenced responses. Finally, swimming distances and rescue competencies were the only water competencies included in the study, further studies should consider the inclusion of other water competencies, both physical and cognitive for minority, and other, groups (Stallman et al., 2017).

Conclusion

This study reinforces earlier research that suggests that many, especially males, may overestimate their competence in being able to swim and rescue others as well as underestimate the risks involved in open water environments. Even though most participants estimated that they could swim a relatively short distance (<25m), almost three-quarters (73%) of participants believed their swimming ability would keep them safe when swimming in open water. Maori and Pasifika are less likely to have participated in aquatics lessons which may account for misconceptions about their ability to protect themselves from drowning in the open water. The greater likelihood for Maori and Pasifika adults to swim in open water environments compared to the general population further increases their risk of drowning, as most drowning occurs in the open water environment. Specifically targeted programmes that include comparisons of real and perceived water competence, education on safe rescue techniques, and transference of skills to the open water are recommended to address the drowning risk. In addition, further research is proposed within high risk minority groups to explore any variances between real and perceived water competencies when swimming in open water.

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