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Kevin Moran

The University of Auckland, k.moran@auckland.ac.nz

Teresa Stanley

WaterSafe Auckland

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Readiness to Rescue: Bystander Perceptions of Their Capacity to Respond in a Drowning Emergency

Kevin Moran and Teresa Stanley

From 1980–2012, 81 persons fatally drowned in New Zealand while attempting to rescue others. Of these, most (80%) were male, and all rescue fatalities occurred in open waters. Festivalgoers ($N = 415$) attending a cultural event in Auckland, New Zealand took part in a water safety survey that included information on their readiness to respond in a drowning emergency. Many indicated they would jump in and rescue a victim (47%), while less than one third (30%) would get flotation to the victim. Significantly more males responded that they would jump in and attempt a rescue (males 55%, females 40%). Most (62%) estimated that they could only swim less than 100 m; 85% reported having swum that distance in a swimming pool rather than in open water where most rescues take place; and one half (50%) had last swum the distance more than one year ago. Ways of promoting safe rescue knowledge are discussed and further research directions are identified.

In countries with easy access to water, the risk of drowning is omnipresent, regardless of whether contact with the water was intentional (such as recreational swimming at a beach) or unintentional (such as falling from a river bank into deep water). While most drowning events are preventable, many require the intervention of others and, in some circumstances, the consequences of such intervention can itself result in loss of human life. The loss of rescuer life in drowning emergencies has recently been described by Franklin and Pearn (2011) as the aquatic victim-instead-of-rescuer (AVIR) syndrome; in many developed countries, it is a minor but persistent cause of drowning mortality. Rescuer fatalities are often dramatically reported in the lay press, especially where the rescue of children is concerned, but, until recently, research studies on the phenomenon have been lacking. Furthermore, the attempted rescue of others from drowning has often been elevated to heroic proportions in the film industry, with many films portraying what not to do in a drowning event (Avramidas, 2011).

From 1980 to 2012, 81 persons drowned in New Zealand while attempting to rescue others. Of these, most (80%) were male, and Maori (33%) and Pasifika (12%) people were over-represented (Water Safety New Zealand, 2013a). All rescue fatalities occurred in open waters, with beaches (54%) and rivers (22%) being the most frequent sites of drowning. At a conservative economic estimate of \$3.4 million per drowning fatality (Accident Compensation Corporation, 2009),

Kevin Moran is with the Faculty of Education at the University of Auckland, Auckland, New Zealand.
Teresa Stanley is with WaterSafe Auckland in Auckland, New Zealand.

this mainly preventable source of drowning represents a multimillion dollar health issue annually.

Further compounding the issue of rescue from drowning is the lack of knowledge of the real extent of life-threatening submersion experiences (LTSEs)—incidents that did not involve official responses (e.g., by lifeguards, search and rescue, or Coast Guard), but may have involved bystanders in the rescue activity (Moran, 2010). A survey of 1,000 adults in the U.S. found that the magnitude of the problem may be greater than imagined with one in every two adults (48%) having reported an LTSE (American Red Cross, 2009). A survey of 3,000 adult beachgoers (McCool, Moran, Ameratunga, & Robinson, 2008) found that one third (30%) reported having had an LTSE. Gulliver and Begg (2005) noted that males reported most (63%) of the 141 submersion incidents among 1,037 New Zealand 21-year-old adults. In New Zealand, a nationwide youth water safety survey (Moran, 2003) found that more than a third (37%) of youth ($N = 2,202$) self-reported an LTSE, reaffirming earlier claims by Schuman, Rowe, Glazer, and Redding (1977) that actual drowning figures are only the tip of the drowning iceberg.

Retrospective studies of fatal drowning incidents where the rescuer has become the victim have been reported in the U.S. (Centers for Disease Control [CDC], 1986; Smith & Brenner, 1995), Australia (Franklin & Pearn, 2010, 2011; Franklin, Scarr, & Pearn, 2010), Turkey (Turgut & Turgut, 2012; Turgut, 2012), Ireland (Donohue, 2011), and the Netherlands (Venema, Groothoff, & Bierens, 2010). Some studies have focused on drowning incidents involving the attempted rescue of children (Franklin & Pearn, 2011) and adolescents (Smith & Brenner, 1995). Other studies have analyzed the circumstances surrounding the rescuer drowning and associated risk factors including age, sex, and environmental factors. Turgut and Turgut (2012) reported of the 88 rescuer drowning incidents in Turkey from 2004 to 2008, most rescuer victims were male (72%), many were aged less than 18 years (42%), most incidents occurred in fresh, open water (69%), and most primary drowning victims (PDVs) were children (75%). In Australia, Franklin and Pearn (2011) found of the 17 rescuer fatalities involved in 15 child-related rescue attempts from 2002 to 2007, most were male parents/relatives (76%), most were unfamiliar with the aquatic location (82%), and most child victims survived the incident (93%). In the Netherlands, Venema and colleagues (2010) analyzed 289 rescue reports involving 343 victims from 1999 to 2004 and found that most rescues involved dangerous circumstances, such as cold or ice-cold water (87%); deep water (95%); swimming to the victim (70%); poor water visibility (65%); and multiple victims (25%).

Recently, some attempt has been made to analyze the underlying motivations of the rescuer who drowns (Pearn & Franklin, 2012), but little is known about what skills and knowledge the rescuer possessed that may have prevented their drowning. One study has found that more than half of fit adults tested in a simulated drowning incident on dry land could not throw a lifeline accurately (Pearn & Franklin, 2009). Other studies have identified a lack of lifesaving training. A nationwide water safety survey of New Zealand youth found that one third (35%) considered that they had no rescue ability, and more than one half (59%) expressed doubts about their ability to perform a deep-water rescue (Moran, 2008). A lack of rescue ability has also been reported among 21-year-old Dunedin young adults, most of whom (52%) had not received any lifesaving training (Gulliver & Begg, 2005). In a study of parents/caregivers ($N = 769$) in charge of children under 10

years of age at 18 New Zealand beaches during the summer of 2007, more than three quarters (76%) of the adults surveyed had not received any rescue/lifesaving training (Moran, 2009). Importantly, male beachgoers 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.

While the risk factors associated with bystander rescue are now well known and reported, it is unlikely that altruistically motivated rescuers will resist impulsive attempts to rescue a drowning person (Pearn & Franklin, 2012). Educating people about how to respond without endangering their own life has become the focus of attention and the promotion of noncontact rescue techniques in lifesaving literature is now the norm (e.g., Royal Life Saving Australia, 2006). In New Zealand, rescue skills have traditionally been taught within the swimming and lifesaving component of the Physical Education syllabus (Department of Education, 1987; Ministry of Education, 1999); however, evidence of how well-informed or equipped members of the public are to engage in rescue activity is lacking. It is the purpose of this preliminary study to report on the perceived readiness of adult New Zealanders to help a person in danger of drowning and to make recommendations based on the findings to inform the promotion of safe bystander rescue.

Method

The study consisted of a cross sectional survey of visitors to a large cultural festival held annually in Auckland that reflects the cultural diversity of a city where 40% of inhabitants were born in other countries. The primary purpose of the survey was to elicit information on the aquatic recreation and understanding of water safety of minority groups so that water safety programs could be developed to address any special needs.

Participants

The survey was conducted over one weekend in March 2013 in conjunction with a water safety promotion at a Pasifika Festival in Auckland that annually attracts over a quarter of a million visitors. The survey was part of an interactive package of water safety promotion aimed at minority groups who are frequently over-represented in drowning statistics in multicultural settings such as Auckland (Water Safety New Zealand, 2013b). Festivalgoers were encouraged to engage with water safety personnel by taking part in the survey, talking about water safety issues, and by receiving water safety information resources.

A total of 415 festivalgoers agreed to take part in a water safety survey while attending the annual Pasifika cultural festival. Of these, 57% were female and 43% male; 39% self-identified as European New Zealanders, 14% as Maori, 30% as Pasifika, 15% as Asian, and 2% as of other ethnic groups.

Survey Instrument and Measures

A brief, self-complete anonymous questionnaire, expected to take 10–15 min to complete, contained 11 questions that sought information on engagement in aquatic

recreation, swimming, rescue and first aid competencies, and sociodemographic characteristics including sex and ethnicity. Participation in various forms of aquatic recreation (such as *swimming*, *rock-based fishing*, and *boating*) during the previous year was included as a proxy indicator of exposure to drowning risk and bystander rescue possibility. Swimming competency was self-assessed using a 5-point scale including *cannot swim*, *swim 25–50 m*, *swim 50–100 m*, *swim 100–200 m*, *swim more than 200 m*. Follow-up questions asked respondents where (*in a pool*, *at the beach*, *at a lake*, *in a river*) and when (*last month*, *last year*, *last 10 years*, *>10 years*) they had last swum the distance. One multiple response question on how participants would respond if they saw someone in trouble in the water gave four possible responses including: *call 111* (the New Zealand emergency number), *get flotation to the victim*, *jump in and save the victim*, *call a lifeguard*. Another question on bystander response competency asked participants if they could perform basic first aid and how confident/anxious they felt about giving first aid.

Data Analysis

All data from the completed questionnaires were double-entered into Microsoft Excel (2004), and cleaned data were transferred to SPSS Version 20 for statistical analysis. Frequency tables using numbers and percentages were generated to report on respondents swimming, rescue, and first aid competencies. Chi-square tests ascertained the associations among dependent variables, such as swimming and first aid competencies, and independent variables such as sex and ethnicity.

Results

Most respondents reported having participated in aquatic recreational activity in the past year; swimming (88%), boating (33%), and rock-based fishing (21%) were the most reported activities. Significantly more males than females reported having taken part in rock-based fishing (males 26%, females 17%), $\chi^2(1) = 5.259, p = .022$, and boating (males 26%, females 17%), $\chi^2(1) = 5.928, p = .015$. Significantly more females than males took part in swimming activity (females 91%, males 83%), $\chi^2(1) = 6.585, p = .010$. No significant differences were found in aquatic recreation when analyzed by ethnic grouping.

Self-Reported Swimming Competency

Table 1 shows that almost two thirds (62%) of the participants considered that they could swim 100 m or less; a small proportion (7%) of the participants reported not being able to swim at all. More than one quarter (28%) thought that they could swim more than 200 m. Most reported that they had swum the distance in a swimming pool (85%), with a smaller proportion reported that they had swum the distance in open water (beach 11%, lake 2%, and river 2%). When asked how long ago had they swum the distance, one half reported that they had done so in the previous month (49%); one third had swum the distance in the previous year (33%); and the remainder had swum it in the past 10 year or more (15%) or did not know when (3%).

No significant differences were found when self-estimated swimming competencies were analyzed by sex, but differences were evident when analyzed by ethnicity. Significantly more European than non-European participants were able to swim more than 100 m (European 55%, non-European 28%), $\chi^2(1) = 31.062$, $p < .001$. Significantly fewer Asian (Asian 24%, non-Asian 41%), $\chi^2(1) = 6.345$, $p = .012$, and Pasifika respondents (Pasifika 30%, non-Pasifika 42%), $\chi^2(1) = 6.054$, $p = .014$, thought they could swim more than 100 m.

Rescue and First Aid Response

When presented with four possible choices on how they would respond to seeing someone in trouble in the water, Table 2 shows that the most frequently indicated response was to *call a lifeguard* (60%), and the least frequently indicated response was that they would *get flotation to the victim* (30%). Significant differences were found when the rescue responses *call a lifeguard* and *jump in to save them* were analyzed by sex. Significantly more females than males responded that they would seek the help of lifeguards (females 65%, males 54%), $\chi^2(1) = 5.320$, $p = .021$. Significantly more males than females responded that they would jump in and save them (males 55%, females 40%), $\chi^2(1) = 9.265$, $p = .002$.

When analyzed by ethnic grouping, no significant differences were found in the *call 111* and *call a lifeguard* responses. Significantly more European than non-European participants indicated that they would *get flotation to the victim*

Table 1 Swimming Competency by Distance and Sex

How far can you swim?	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Cannot swim	10	5.6	18	7.6	28	6.7
25–50 m	54	30.2	99	41.9	153	36.9
50–100 m	37	20.7	37	15.7	74	17.8
100–200 m	25	14.0	18	7.6	43	10.4
> 200 m	53	29.6	64	27.1	117	28.2
Total	179	100.0	236	100.0	415	100.0

Table 2 Rescue Responses by Sex

	Male		Female		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Call 111 (i.e., emergency number)	79	44.1	110	46.6	189	45.5
Get flotation to the victim	54	30.2	69	29.2	123	29.6
Jump in to save them	99	55.3	95	40.3	194	46.7
Call a lifeguard	96	53.6	153	64.8	249	60.0

(European 42%, non-European 22%), $\chi^2(1) = 18.092, p < 0.001$. More Pasifika than non-Pasifika participants indicated they would *jump in and save the victim* (Pasifika 55%, non-Pasifika 43%), $\chi^2(1) = 4.843, p = .028$, and fewer Pasifika participants would *get flotation aid to the victim* (Pasifika 21%, non-Pasifika 33%), $\chi^2(1) = 6.701, p = .010$. Fewer Asian participants reported that they would *jump in and save them* (Asian 26%, non-Asian 51%), $\chi^2(1) = 13.129, p < 0.001$, and fewer Asian participants indicated that they would *get flotation to the victim* (Asian 16%, non-Asian 32%), $\chi^2(1) = 6.379, p = .012$.

As a proxy measure of their readiness to provide primary care in a drowning emergency, participants were asked to indicate their confidence in their ability to deliver first aid. One half (53%) of the respondents considered themselves confident in their ability (Table 3). One third (35%) felt anxious, and some (12%) indicated that they could not provide first aid assistance.

No significant differences were found when first aid ability was analyzed by sex or ethnicity, except than more Asian than non-Asian respondents lacked confidence in their ability to perform first aid (Asian, 61%, non-Asian 45%), $\chi^2(1) = 5.583, p = .018$. Slightly more females than males (females 56%, males 50%) were confident in their first aid capacity.

Discussion

The primary goal of this paper was to examine public perceptions of their readiness and capacity to respond to a potential drowning situation by analyzing (1) their perceived swimming and first aid competency and (2) their knowledge of rescue responses. The results suggest that many participants in this study may not possess the necessary skills and knowledge to safely come to the aid of others. Further compounding the risk of drowning during attempted rescue is the high-risk nature of activities (such as rock-based fishing and boating) reported among male participants in the study. These are activities that often take place in areas away

Table 3 Readiness to Provide Basic First Aid

	Confident		Anxious		No First Aid		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Male	89	49.7	68	38.0	22	12.3	179	43.1
Female	132	55.9	78	33.1	26	11.0	236	56.9
Total	221	53.3	146	35.2	48	11.6	415	100.0
European	91	56.5	56	34.8	14	8.7	161	38.8
Maori	31	54.4	20	35.1	6	10.5	57	13.7
Pasifika	69	55.2	41	32.8	15	12.0	125	30.1
Asian	27	43.5	25	40.3	10	16.1	62	14.9
Other	3	0.7	4	1.0	3	0.7	10	2.4
Total	221	53.3	142	35.2	45	10.8	415	100.0

from immediate access to rescue services and where rescue from unintentional submersion is likely to require bystander action in the first instance.

Given that the public perception of a rescue is the in-water retrieval of a drowning person, and rescuers who drown do so when attempting to execute an in-water retrieval, the swimming competency that bystanders bring to the emergency would axiomatically appear critical. In this study, most respondents were not strong swimmers; almost two thirds (62%) estimated that they could swim only 100 m or less. Most (85%) reported having swum that distance in the closed confines of a swimming pool rather than in open water where most rescues take place, and only one half (49%) had swum the distance recently (\leq one month). The lack of swimming competency as measured by the estimated distance swum, the lack of recency of having swum that distance, and the infrequency of having done the distance in open water (only 15% had swum the distance in lake, rivers, or the sea) suggest that few are prepared for the task of in-water retrieval in an open water environment. Another indication of the lack of competency of would-be rescuers is evident in the finding that almost one half (47%) of respondents were either anxious about performing, or did not know how to perform, basic life support in a drowning situation.

Participant responses to how they would react if they saw someone in trouble in the water suggests that, in addition to lacking the physical skill required of an open water rescue, many may not be aware of appropriate rescue responses. The most frequently indicated response was to *call a lifeguard* (60%), entirely appropriate when such services are readily available, but of little value where no such services exist or where remoteness of incident are factors. Alarming, the least frequently indicated response, *getting flotation to the victim*, would most likely be, in many open water rescue situations, the most effective immediate response of the choices given. Of greatest concern, because it was potentially the most dangerous response, is that almost one half (47%) of respondents reported they would dive in and rescue the victim. Furthermore, more than one third (37%) of those who could not swim 100 m (almost two thirds of the would-be rescuers) reported that they would dive to rescue someone. This suggests that the least capable would-be rescuers may be at greater risk of drowning by failing to recognize their limitations; this is a condition identified in intellectual and social studies as the Dunning-Kruger effect, where people fail to recognize their own incompetence (Kruger & Dunning, 1999; Dunning, Johnson, Ehrlinger & Kruger, 2003). In the case of would-be rescuers, however, the consequences may result in making poor, potentially fatal, decisions in a drowning emergency. Given the lack of self-reported swimming competency, it is difficult not to conclude that few respondents would meet the demands of supporting and transporting a struggling victim to safety in the water without putting themselves at considerable risk of drowning. Further research is required to confirm whether this initial finding is evident in other demographic groups, especially in high-risk groups such as youth and males.

In addition to taking part in more high-risk activities, males may be greater risk of drowning as would-be rescuers because of their confidence (rather than competence) in being able to perform a rescue or extricate themselves from trouble without assistance. As has been suggested in previous studies, male underestimation of drowning risk and overestimation of their ability to manage that risk (Bennett, Quan, & Williams, 2002; Gulliver & Begg, 2005; Howland, Hingson, Mangione, Bell, & Bak, 1996; McCool, Moran, Ameratunga, & Robinson, 2008) may extend

to the open water rescue situation given that no significant sex differences were found in self-reported swimming and first aid competency, yet significantly more males indicated they would jump in and save the victim (males 55%, females 40%). Interestingly, females in the current study were more likely than males to seek help from lifeguards (females 65%, males 54%) or call the emergency services (females 47%, males 44%). Results of a previous study have suggested that more males reported self-rescue from a life-threatening situation (males 60%, females 46%), while more females reported being rescued by friends/family members (females 39%, males 28%; Moran, 2010). Whether such evidence reflects male reticence to call for help or whether they are more capable of extricating themselves from life-threatening situations in the water than females requires further study.

In addition to sex differences in rescue readiness, some ethnic groups appear less competent than others. Pasifika or Asian respondents reported less swimming competency than Maori or European respondents, and fewer Asian than non-Asian respondents were confident that they had the first aid skills, confirming previous findings of a lack of bystander emergency skills (such as CPR) among new residents (Moran & Willcox, 2013). In terms of the rescue responses, significantly more European than non-European and significantly less Pasifika and Asian participants reported they would get flotation to the victim, while more Pasifika than non-Pasifika reported that they would enter the water to rescue the victim. These differences may be indicative by a lack of water safety education and the opportunity to learn safe lifesaving techniques, as previously reported among Asian youth (Moran, 2006) and Pasifika youth (Moran, 2007). Targeted education interventions may help address these shortcomings, especially among those exposed to high-risk activities (such as rock-based fishing) that may require independent immediate rescue response.

Some evidence from low- and middle-income countries, where trained lifeguard supervision is often not available, suggests that teaching children appropriate rescue skills may reduce the rate of rescuer drowning and increase the effective intervention of bystanders. Rahman and colleagues (2011) reported increased rescue activity by some (6%, $n = 621$) of the 5,274 graduates of a Swimsafe program, with most of these reporting the rescue of children younger than themselves who were in the water at the same time as the rescuer. Pearn and Franklin (2009) suggest that the simple act of being able to accurately throw a lifeline, sadly lacking in the adults that they tested, is a skill that can be easily taught. Promotion of safe rescue knowledge such as the hierarchy of “talk, reach, throw, wade, row, and tow” (Royal Life Saving Society Australia, 2006) in schools and in the public domain would seem prudent given the readiness to respond and ill-conceived responses reported in this present study. Further research is required to determine the nature and extent of lifesaving education as part of current water safety education, both in schools and in the public domain where evaluations of lifesaving education programs are sadly lacking.

Limitations

Results from this study should be treated with some caution in light of several methodological limitations. First, the data were obtained from a convenience sample of festivalgoers attending a cultural event, consequently the sample population

varied from the national population demographics with more females and more Pasifika and Asian people taking part in the study. Second, self-estimation of swimming competence, even though often used in studies on water safety, can result in measurement error and might not accurately express true competence (Mickalide, 1997; Robertson, 1992; Watson, Kendrick, & Coupland, 2003). Third, rescue knowledge or prior training was not explicitly sought; further research is required to ascertain the nature and extent of rescue knowledge and training. Finally, given the cross sectional design, the associations observed in this study cannot be assumed to be either causal of safe or unsafe rescue response but only relational. These limitations notwithstanding, the findings do provide evidence of questionable readiness to respond in a rescue role as a bystander confronted with a drowning emergency. Further research is required to corroborate these findings among other sectors of society, especially where a duty of care in the supervision of planned water activity is evident or where unintentional immersion in water is possible in nonrecreational settings.

Conclusions

The results of this exploratory study on public readiness and capacity to engage in the rescue of a drowning victim has demonstrated that, despite a desire to respond in a rescuer role, many participants may lack the physical competency and knowledge to engage in safe rescue activity. The lack of understanding of appropriate rescue response is suggestive of a failure in current water safety promotion messages regarding safe ways of helping others in difficulty in water. Further research is required to determine: (1) the knowledge base that informs public thinking on their role as bystanders in a drowning situation; (2) how knowledge of rescue techniques is acquired; (3) what real rather than perceived rescue skills bystanders possess; and (4) how best these skills can be promoted. Empowering first responders to make safe decisions in moments of great duress via the promotion of safe rescue techniques is yet another link in the chain of drowning prevention that demands the attention of water safety advocates. The economic implications of the financial cost to the country, and the emotional and social cost to families, communities, and society, makes the continued advocacy of safety education in schools and the community of safe rescue skills imperative.

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