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Water Safety Practices and Perceptions of “New” New Zealanders

Kevin Moran and Stacey Willcox

Culturally and linguistically diverse populations are generally overrepresented in the drowning statistics of high income countries. This paper reports on Asian immigrants' aquatic recreation and water safety in the aquatically-oriented Auckland region. A survey of new settlers (n = 570) was conducted at seven cultural festivities using a self-complete questionnaire that sought information on immigrants' current and previous aquatic recreation and their understanding of water safety. Almost half (43%) had never participated in aquatic recreation prior to coming to New Zealand, and most (72%) now did more aquatic recreation. Most participants (73%) estimated that they could swim less than 50m, one half (47%) had never been taught to swim and had never received water safety education (63%) or CPR training (65%). Given the continuing influx of new settlers in New Zealand, water safety programs that are sensitive to the needs of diverse peoples should be persisted with and focus on identified high-risk activities.

The Asia-Pacific region in recent years has been one of the more dynamic regions for the movement of peoples and evidence of this in contemporary New Zealand society abounds. The transformative power of this trend is one that offers increased opportunities for economic growth and social and cultural innovation (Koser & Laczko, 2010). It also has the potential to exacerbate existing problems and generate new challenges within society. This paper focuses on one such challenge—that of preventing the incidence of drowning through water safety education among Asian immigrants in an aquatically-oriented island nation.

From 2007 to 2011, 40 Asian New Zealanders died of drowning, half (50%) of these drowning fatalities were associated with recreational activity, and 22 (56%) of those occurred in the Auckland region (Water Safety New Zealand, 2012). Changing demographics can partially explain these statistics. In the past decade, New Zealand, in general, and Auckland, in particular, have become very culturally and linguistically diverse. In 2006, 23% of people living in New Zealand were born overseas, compared with 17% in 1996 (Statistics New Zealand, 2010). Furthermore, more than one-third (37%) of residents in the Auckland Region at the time of the 2006 Census were born overseas. Comparisons of census data from 2001 to 2006 indicate rapid ethnic change. The number of residents having immigrated from China increased by 41%, from India by 68%, from Korea by 62%, and from The Philippines by 53% (Statistics New Zealand, 2010).

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A survey of Auckland's west coast rock-based fishers ($n = 250$) in 2006 reported that almost half (42%) of the fishers surveyed at high risk sites were recent residents (< 4 years), and half (49%) self-identified as of Asian ethnicity (Moran, 2008a). When self-estimated swimming competency of fishers was analyzed by ethnicity, almost half (45%) of Asian fishers thought they could not swim 25m (Moran, 2008a). New Zealand is not alone in its high fatal drowning toll due to fishing from rocks. Australia has reported a similar problem with almost half of the victims in 101 recreational fishing fatalities from 2000 to 2007 being described as of Asian ethnicity (Crosariol, Vasica, & Franklin, 2010). Other studies have suggested that young immigrant populations are at greater risk of drowning than long-term residents (for example, in the United States, Smith & Brenner, 1995; in Australia, Nixon & Pearn, 1978; Mackie, 1999; Morgan, Ozanne-Smith, & Triggs, 2008; in Holland, Verweij & Bierens, 2002; in Denmark, Lindholm & Steensberg, 2000). It is the purpose of this study to survey Asian immigrants in the Auckland region to ascertain, first, the nature and extent of aquatic recreation among new settlers and, second, what they bring to that participation in terms of their understanding of water safety.

Method

Participants

A cross-sectional survey of visitors to seven Asian cultural festivals was conducted over a two-year period in Auckland from 2010 to 2012. The convenience sample was obtained at seven sites that included the Auckland Migrant Expo, the Auckland Chinese New Year Festival, the Korean Day celebrations in 2011 and in 2012, the Asian Food Carnival and Moon Festival, the Indian Diwali Festival, and the Holi Mela Festival of Lights. These festivals were selected because of their popularity with Asian immigrants. The surveys were conducted by volunteers as part of a wider summer water safety campaign that targeted immigrant communities. Surveys were available in Chinese and Korean. Volunteers with Mandarin, Cantonese, and Korean language skills were used at the relevant events to effectively engage with the community and increase response rate.

A total of 648 festival goers agreed to take part in a water safety survey while attending one of the seven cultural festivals held in the Auckland region during 2010–12. Those born in New Zealand ($n = 78$) who completed the survey were not included in the data analysis, resulting in a sample of 570 nonnative born immigrant respondents. Of these, 52% were female and 48% male; 35% were 16–29 years, 28% were 30–44 years, and 37% were 45 years and older. Almost half (45%) of the participants self-identified as Chinese, 35% as Korean, 9% as Indian, and 11% as “other” Asian peoples. One quarter (28%) had been a resident in New Zealand for less than 4 years, 43% for 5–9 years, and 30% for more than 10 years.

Survey Instrument and Measures

A brief, self-completed, anonymous questionnaire containing 20 questions sought information on sociodemographic characteristics, including age, sex, length of residency, and country of previous residence. To avoid the limitations imposed

by grouping all respondents as Asian (Rasanathan, Craig, & Perkins, 2004), participants were asked to describe their place of long-term residency before living in New Zealand. Swimming competency was self-assessed using a 4-point scale including *cannot swim*, *swim 50m*, *swim 200m*, *swim 400m* (nonstop in a pool). Floating competency was self-assessed using a three-point scale including *cannot float*, *float for 1–4 min*, *float for > 5 min*. A follow-up question asked respondents how confident/anxious they felt about performing the swimming/floating skills in open water. Two questions focused on CPR competency, the recency of training, and how confident/anxious participants felt about doing CPR in an emergency. A comparative question sought information on the extent of their aquatic recreation in their previous country of residence compared with how much they did currently in New Zealand.

Two questions sought information on the nature and extent of aquatic activity since becoming New Zealand residents. One question focused on swimming activity by location such as public pool or surf beach while the other asked about nonswimming aquatic recreation such as fishing, boating, and seafood gathering. Frequency of participation was assessed using a 4-point Likert-type scale ranging from *never*, *sometimes* (annually), *often* (monthly) and very often (*weekly*). Both forms of aquatic activity in New Zealand were dichotomized as low frequency (*never/sometimes*) and high frequency (*often/very often*) for analysis purposes. A final question, consisting of six statements related to water safety such as likelihood of swimming between the patrol flags at a surf beach, sought to reveal attitudes on water safety using a 3-point scale of *agree*, *disagree*, *unsure*.

Data Analysis

All data from the completed questionnaires were double entered into Microsoft Excel (2004) and cleaned data transferred to SPSS version 19 for statistical analysis. Frequency and percentages were calculated to report the sociodemographic differences in aquatic activity, water safety competencies of swimming, floating, and CPR, and water safety attitudes. Chi-square tests ascertained the associations among dependent variables, such as swimming, floating, and CPR competency, and independent variables such as age, sex, length of residency, and country of origin.

Results

One third of respondents (36%) reported that, before immigrating to New Zealand, they never had engaged in aquatic recreation, one half (48%) reported some aquatic activity once annually, and almost one sixth (16%) reported that they did so once a month or more. When asked whether they now engaged in more or less aquatic recreation since residing in New Zealand, one half estimated that they now did a little more (52%) and one quarter (26%) thought they did a lot more aquatic recreational participation.

Frequency of aquatic recreation

Table 1 shows what swimming and other aquatic recreation the immigrants surveyed took part in during the previous year. Most (80%) had swum in a public swimming pool and almost half (47%) reported doing this *often* (once a month or more) or *very*

Table 1 Frequency of Swimming and Other Aquatic Recreational Activity While Resident in New Zealand (N = 570)

| | Never | | Sometimes (Annually) | | Often (Monthly) | | Very Often (Weekly) | |
|--------------------------|-------|------|----------------------|------|-----------------|------|---------------------|------|
| | n | % | n | % | n | % | n | % |
| Do you swim at . . . | | | | | | | | |
| Public/school pool | 117 | 20.5 | 188 | 33.0 | 196 | 34.4 | 69 | 12.1 |
| Patrolled surf beach | 371 | 65.1 | 139 | 24.4 | 48 | 8.4 | 12 | 2.1 |
| Non-patrolled surf beach | 436 | 76.5 | 100 | 17.5 | 21 | 3.7 | 13 | 2.3 |
| Flat-water beach | 291 | 51.1 | 183 | 32.1 | 80 | 14.0 | 16 | 2.8 |
| Lake, pond, waterhole | 482 | 84.6 | 66 | 11.6 | 17 | 3.0 | 5 | 0.9 |
| At home pool | 487 | 85.4 | 50 | 8.8 | 17 | 3.0 | 16 | 2.8 |
| Do you ever go . . . | | | | | | | | |
| Boating | 441 | 77.4 | 100 | 17.5 | 25 | 4.4 | 4 | 0.7 |
| Land-based fishing | 343 | 60.2 | 164 | 28.8 | 49 | 8.6 | 14 | 2.5 |
| Collecting shellfish | 263 | 46.1 | 240 | 42.1 | 58 | 10.2 | 9 | 1.6 |
| Surfing | 495 | 86.8 | 61 | 10.7 | 11 | 1.9 | 3 | 0.5 |
| Paddling | 445 | 78.1 | 103 | 18.1 | 17 | 3.0 | 5 | 0.9 |

often (weekly). Swimming at beaches was not as popular, with most respondents reported *never* swimming at either flat-water (51%) or surf beaches (patrolled 65%, nonpatrolled 77%). Asian immigrants were not frequent participants in other forms of aquatic recreation although more than half (54%, $n = 307$) reported collecting shellfish and 40% had engaged in land based fishing.

Swimming and other aquatic activity were each analyzed by age, sex, length of residency, and country of origin. When aquatic activities were summed, significantly more males than females took part in total swimming activity, $\chi^2(1) = 17.827, p = < 0.001$, and other aquatic recreation activities, $\chi^2(1) = 28.547, p = < 0.001$. Significant age differences were evident for swimming, $\chi^2(1) = 12.212, p = < 0.001$, and other aquatic recreation, $\chi^2(1) = 3.827, p = .050$, with immigrants less than 30 years old participating more than those older than 30 years of age. Males also were significantly more likely to participate in other aquatic activities including boat-based fishing, $\chi^2(1) = 43.617, p = < 0.001$, and land-based fishing, $\chi^2(1) = 55.893, p = < 0.001$, with twice as many males participating in boat- and land-based fishing (males 35% and 54%, vs. females 16% and 27%). No significant differences were found when swimming and other activities were analyzed by length of residency or country of previous residency.

Water Safety Competencies

Table 2 shows that one third (31%) of immigrants self-reported that they could not swim, and, cumulatively, three quarters (74%) estimated that they could swim up

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Table 2 Self-Estimated Swimming Competency and Confidence to Swim in Open Water

| | <i>n</i> | % | <i>Cumulative</i> % |
|---|----------|-------|------------------------|
| How far can you currently swim nonstop? | | | |
| Cannot swim | 179 | 31.4 | 31.4 |
| 50 m | 241 | 42.3 | 73.7 |
| 200 m | 78 | 13.7 | 87.4 |
| 400 m | 72 | 12.6 | 100.0 |
| How do you feel about swimming in open water? | | | |
| Not confident, I avoid it | 257 | 45.1 | 45.1 |
| Only swim in calm water | 234 | 41.1 | 86.1 |
| Confident in rough water | 79 | 13.9 | 100.0 |
| Total | 570 | 100.0 | |

to 50m. Almost half (45%) of the respondents avoided swimming in open water, and only 14% felt confident about swimming in rough water. Almost two thirds (63%) had not received any water safety education and, of those who had been taught (38%; $n = 214$), almost half (47%) had been taught at primary school, and one third (35%) at high school, and the remaining 18% had been taught at home.

Significantly more males than females, $\chi^2(1) = 25.213, p = < 0.001$, estimated that they could swim up to 50m (males 77% vs. females 57%) and significantly more long-term than recent residents, $\chi^2(3) = 11.949, p = .008$, estimated that they were able to swim up to 50m (resident > 5 years 68% vs. resident < 5 years 52%). Proportionally more immigrants of Chinese (67%) and Korean (67%) origin than Indian (51%) respondents reported that they could swim up to 50m, $\chi^2(6) = 16.418, p = .012$. No significant difference was found when swimming competency was analyzed by age group.

Table 3 shows that one third of respondents (32%) estimated that they could not float at all, while another 30% believed that they only could float for four minutes or less. Almost half (45%) of the respondents felt anxious about floating in open water. Significant differences were found when self-reported floating competency was analyzed by sex, $\chi^2(1) = 43.222, p = < 0.001$, with twice as many females than males reporting that they could not float in deep water (females 43% vs. males 20%). Length of residency also produced significant differences, $\chi^2(3) = 33.912, p = < 0.001$, with recent residents least likely to be able to float (resident < 5 years 38% vs. resident > 5 years 28%). No significant differences were detected based on country of previous origin with Indians (42%), Chinese (35%), and Koreans (28%) respondents reported they could not float. No significant differences also were found when floating competency was analyzed by age.

Table 3 shows that two thirds (64%) of respondents thought that they could not perform CPR and almost three quarters (72%) felt anxious about doing CPR in an

Table 3 Self-Estimated Flotation and CPR Competency and Confidence

| | <i>n</i> | % | <i>Cumulative</i> % |
|--|----------|--------|------------------------|
| How long can you stay float? | | | |
| Cannot float | 182 | 31.9 | 31.9 |
| Can float for 1-4 minutes | 171 | 30.0 | 61.9 |
| Can float for > 5 minutes | 217 | 38.1 | 100.0 |
| How do you feel about floating in open water? | | | |
| Anxious | 256 | 44.9 | 44.9 |
| Confident | 314 | 55.1 | 100.0 |
| Can you perform CPR? | | | |
| Yes | 203 | 35.6 | |
| No | 367 | 64.4 | |
| How do you feel about doing CPR in an emergency? | | | |
| Anxious | 411 | 72.1 | |
| Confident | 159 | 27.9 | |
| Total | 570 | 100.0% | |

emergency. Of those who had received instruction in CPR (36%; $n = 203$), almost two thirds (62%; $n = 129$) had been trained < 3 years previously. Significantly more females than males, $\chi^2(1) = 45.630, p = < 0.001$, reported that they were unable to perform CPR (females 71% vs. males 57%). No significant differences were found in CPR competency when analyzed by age (< 30 years 66% vs. > 30 years 64%), length of residency (resident < 5 years 69% vs. resident > 5 years 63%). Differences among immigrant nationalities were not statistically significant with Chinese (65%), Korean (71%), Indian (56%), and “other” Asian immigrants (55%) reporting they could not perform CPR. No significant differences were found in confidence to perform CPR in an emergency setting when analyzed by age and length of residency. Significantly more females than males, $\chi^2(1) = 45.630, p = < 0.001$, reported feeling anxious about performing CPR (females 84% vs. males 59%).

Confidence in Open Water Settings

When asked how confident they felt about swimming in open water, almost half (45%) did not feel confident while 41% reported that they only swam in calm water. Significant differences were found by age, $\chi^2(2) = 18.233, p = < 0.001$, with older respondents more likely to avoid swimming in open water (< 30 years 33% vs. > 30 years 52%), and by sex, $\chi^2(2) = 43.147, p = < 0.001$, with more females likely to avoid swimming in open water (females 57% vs. males 32%). No significant

differences were found when swimming confidence levels were analyzed by length of residency or country of previous origin.

When asked how they felt about floating in open water, more than half (55%) reported feeling anxious about the task. Significantly more females than males, $\chi^2(1) = 32.456, p < 0.001$, felt anxious about floating in open water (females 66% vs. males 43%). No significant differences were found when floating confidence levels were analyzed by age, length of residency, or country of previous residence.

Water Safety Attitudes

Table 4 shows the responses to the six statements related to recreational water safety. While most statements precipitated safety conscious responses, the surf-related statements elicited the least safe responses (59% correct responses); supervision of young children in the water (82% correct response) elicited the safest response.

When safe responses were summed and analyzed by age, length of residency, and country of previous residence, no significant differences were found. Significant differences were evident when safe responses were summed and analyzed by sex, $\chi^2(12) = 65.280, p < 0.001$. In addition, more females than males gave safe individual responses to statements relating to swimming outside surf patrol flags (females 65% vs. males 51%), swimming in surf after patrol hours (females 66% vs. males 52%), wearing a lifejacket close to shore (females 75% vs. males 57%), drinking beer while fishing from a boat (females 78% vs. males 63%), drinking on a boat with a sober skipper (females 73% vs. males 58%), and supervising young children in the water (females 85% vs. males 78%).

Table 4 Water Safety Opinions Expressed by Immigrants to New Zealand (N = 570)

| | Agree | | Disagree | | Don't Know | |
|---|-------|------|----------|------|------------|------|
| | n | % | n | % | n | % |
| Do you think that ... | | | | | | |
| Swimming outside surf patrol flags is ok if it looks safe. | 141 | 24.7 | 334 | 58.6 | 95 | 16.7 |
| Swimming after surf patrol has ended is okay if other people are in the surf. | 93 | 16.3 | 337 | 59.1 | 140 | 24.6 |
| Wearing a life jacket in a small boat is unnecessary if close to shore. | 111 | 19.5 | 375 | 65.8 | 84 | 14.7 |
| Drinking beer while fishing from a small boat is okay on a calm day. | 107 | 18.8 | 375 | 65.8 | 88 | 15.4 |
| Drinking alcohol on a small boat is okay provided the skipper stays sober. | 82 | 14.4 | 403 | 70.7 | 85 | 14.9 |
| I do not have to supervise my young children in the water if they know how to swim. | 57 | 10.0 | 466 | 81.8 | 47 | 8.2 |

Discussion

The principal findings of this study suggest that, while Asian immigrants pursue more aquatic recreation in their new home country (i.e., New Zealand) than they did in the country of previous residence, they still were not high frequency participants. Almost half (47%) of immigrants, especially males and younger people (< 30 years of age) had made regular use (> 1 per month) of public swimming pools, a relatively safe and supervised environment, but beaches were less popular. Although relatively few immigrants (11–12%) reported high frequency participation in shellfish gathering and land-based fishing, males and younger people (< 30 years of age) were again most likely to participate. Although only attracting a small proportion of participants, the popularity of land-based fishing among Asian males, especially at high risk sites around rocky surf coastlines, is a concern because of high Asian drowning mortality rates and because previous studies have suggested that these fishers are not well prepared for the management of risk associated with this activity (Moran, 2008a, 2011).

While most Asian immigrants surveyed may not be exposed to high risk aquatic activities such as rock-based fishing, the findings of this study suggest that they still may be at greater risk than others because of their limited self-reported water safety education, water competency, and knowledge. With three-quarters (74%) of the respondents estimating they could currently swim no more than 50m and almost two thirds (62%) not able to stay afloat for as little as 4 min, chances of survival through self-rescue appeared minimal. Moreover, one third of respondents self-reported that they could not swim (31%) or float (32%) at all, making survival from sudden, unintentional immersion problematic. In such an event, the fact that almost two thirds (64%) could not perform CPR and three quarters (72%) felt anxious about having to perform these skills also suggested enhanced risk of drowning in an aquatic emergency. When analyzed by individual countries of previous residence, respondents of Indian residence reported significantly lower swimming and floating skills than other Asian residents. Similar low levels of self-reported competence have been reported in other studies among American adults (Gilchrist, Sacks, & Branche, 2000), youth (Moran, 2008b, 2011) and ethnic minorities (Moran, 2006, 2007; Mael, 1995; Quan, Crispin, Bennett, & Gomez, 2006; Smith & Brenner, 1995).

Targeted interventions aimed at recent immigrants and facilitated via the Asian community and its established networks may be the best way to address the shortcomings identified here among these adult respondents. As previously suggested, targeted intervention in schools with high immigrant populations may help the children and youth of Asian immigrants who may not have had water safety education before arrival in New Zealand (Moran, 2006; Moran & Willcox, 2010). Further study is required to determine whether the low levels of water competency found among the Indian community need to be addressed by specifically targeted adult and child education programs.

While an apparent lack of water competencies may make Asian immigrants more at risk for drowning, it may also make them more risk averse. Some evidence was found to support this possibility. Almost half (45%) reported that they avoided swimming in open water or felt anxious about floating in open water (45%). In addition, many reported positive water safety attitudes with regard to abstaining from alcohol use when boating and the supervision of young children around water.

The least safe responses (59% correct responses) related to swimming between the patrol flags at surf beaches and not swimming after surf patrols have finished. Advice on both feature strongly in standard surf safety promotion so targeted messages using culturally and linguistically appropriate strategies are advised.

The significant male/female differences in water safety attitudes found in this study, with males expressing fewer positive water safety attitudes, is consistent with previous findings among New Zealand beachgoers (McCool, Moran, Ameratunga, & Robinson, 2008), among youth (Moran, 2011), among young adults (Gulliver & Begg, 2005), and among American adults (Howland, Hingson, Mangione, Bell, & Bak, 1996). The findings reinforce the need to change entrenched risky attitudes and behaviors among men engaged in aquatic recreation, irrespective of ethnicity or length of residency, and especially in high-risk situations.

Limitations

Results from this study should be treated with some caution in light of several methodological considerations. First, the data were gathered from a convenience sample obtained from attendees at cultural festivals so it may not be representative of all Asian immigrants. Second, the study relied on self-reported estimates of swimming and floating competency so they may not accurately represent actual water competencies (Mickalide, 1997; Moran et al., 2012; Robertson, 1992; Watson, Kendrick, & Coupland, 2003). Third, the study was confined to Asian immigrants because they constitute the greatest proportion of new settlers in New Zealand. The sample did not include other immigrants from non-Asian backgrounds who also may be at greater risk of drowning than long-term residents. Fourth, while major sources of Asian immigrants were able to be identified and thus enabled closer scrutiny of data, not all possible origins were able to be included in the analysis and were aggregated as "other" Asian peoples. Fifth, given the cross-sectional design of the sample, the associations identified in the study cannot be assumed to be causal or predictive of drowning risk. Notwithstanding these limitations, the results do provide fresh evidence of the enhanced risk of drowning among Asian immigrants to New Zealand who come from culturally and linguistically diverse backgrounds.

Conclusions

The descriptive findings reported in the study suggest that immigrants are quickly adapting to the aquatic lifestyle of their newly-adopted country but, as yet, these same immigrants may lack the safety skills and knowledge to minimize the risk of harm when participating in aquatic activity. In-depth analysis of self-reported aquatic recreation, water competencies, and safety attitudes that Asian immigrants bring to that activity suggest that, as with the long-term residents in high income countries, males appear to engage more often in high risk activity and be less risk averse than their female counterparts. Educational efforts to improve water safety competencies and knowledge should persist and be targeted at immigrant males.

Cultural and linguistic diversity presents unique challenges to water safety educators across a wide spectrum of social and health settings—the need for water safety promotion in and around water and during activities that may be unfamiliar

to new settlers is paramount in an aquatically-oriented society such as New Zealand. Our new peoples, who are likely to be underserved by health promotion and unaware of what their new home can offer by way of education, deserve nothing less than our best efforts at promoting water safety and drowning prevention.

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