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ORIGINAL ARTICLE

What does 'Keep Watch' mean to migrant parents? Examining differences in supervision, cardiopulmonary resuscitation training and water familiarisation

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Abstract

Objectives Drowning is a public health challenge. Children of migrants may be at increased risk as parents may be unaware of local water safety issues. This study explores differences between Australian-born and migrant parents in Western Australia for: (1) swimming ability; (2) supervision; (3) water familiarisation; and (4) cardiopulmonary resuscitation (CPR) training.

Methods A cross-sectional survey of parents and carers of children aged under 5 years residing in WA (n = 1506) captured demographics, knowledge of appropriate supervision, water safety knowledge and skills. Logistic regression was conducted.

Results Migrants were significantly less likely to identify adequate supervision (p = 0.004); have participated in child water familiarisation programmes (p = 0.000); or perceived themselves as able swimmers (p = 0.000). Significantly less migrants had also undertaken CPR training (p = 0.000).

Conclusions Findings add to the small but growing body of literature highlighting the importance of tailored drowning prevention strategies for migrants in countries such as Australia with a strong aquatic culture.

Keywords Migrant · Country of birth · Drowning prevention · Swimming ability · Supervision · Cardiopulmonary resuscitation (CPR) · Public health · Health promotion

Introduction

Child drowning is a significant and preventable public health issue. Across every region in the world, drowning is one of the most common causes of death for children and young people (World Health Organization 2014). In Australia, during 2016–2017, drowning among children aged 0–4 years accounted for 10% (n = 29) of all drowning deaths, an increase of 32% from the previous year, and a 4% increase against the 10-year average (n = 28). There are differences in the demographic composition of, and mechanism for drowning deaths within and between countries and regions and also between low- and middle-income countries (LMIC) and high-income countries (HIC), such as Australia (Leavy et al. 2015, 2017). In LMICs, effective drowning prevention has included water familiarisation, safety training and the establishment of childcare centres for children under 5 years (Leavy et al. 2015; Rahman et al. 2012; World Health Organization 2014), whilst historically in HICs use of barriers to reduce access to home pools, close parent supervision, swimming and water safety programmes and targeted education campaigns have been most effective and commonly implemented strategies (Leavy et al. 2015; Wallis et al. 2015).

Population mobility has contributed to changing epidemiological patterns of drowning. Globally, migration has increased substantially over the past two decades with two

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thirds of all migrations to only twenty countries, the majority of which are classified as high income (United Nations 2016). Reasons for migration are multiple and complex but include security, health, employment, economic inequalities, family reunification or to study (Department of Immigration and Boarder Protection 2016; United Nations 2016). Research suggests that migrants may have different health knowledge, attitudes and skills than that of the destination population (Lee et al. 2013).

Australia has a substantial proportion of migrants, with the number of migrants recently reaching its highest point in 20 years (Department of Home Affairs 2016). In the past 5 years, the Australian population has grown, largely explained by an increase in migration of those joining family members and temporary skilled migrants (Department of Immigration and Boarder Protection 2016). Since 2005 the rate of growth of overseas born residents has exceeded the growth rate of Australian-born residents (Department of Immigration and Boarder Protection 2016). Ten per cent of Australia's migrants have settled in WA (Department of Immigration and Boarder Protection 2017), with a number of these arrivals coming from non-English-speaking backgrounds (Australian Bureau of Statistics 2016). Of interest, migrants and tourists accounted for approximately a third of all drowning deaths in 2015–2016 (Royal Life Saving Society WA 2017a).

Little is known about the differences in dynamics of fatal drowning between those born in Australia and overseas (Australian Water Safety Council 2016). With a third of the total Australian population born overseas (Australian Bureau of Statistics 2017), this is an important consideration for public health policy and more specifically for drowning prevention among migrants and those from culturally and linguistically diverse (CaLD) backgrounds.

The Australian Water Safety Strategy 2016–2020 identifies CaLD communities as high-priority populations for water safety and drowning prevention initiatives (Australian Water Safety Council 2016). This is consistent with findings in the drowning prevention literature (Felton et al. 2015; Jasper et al. 2017; Karimi et al. 2015; Mahony 2017; Matthews and Grace 2012; Vogel 2010) which suggest that children of new migrants may be at increased risk of drowning because parents and other community members may be unaware of or unfamiliar with local water safety issues and aquatic conditions (Royal Life Saving Society—Australia 2012). In addition, a range of barriers have been cited regarding participation in aquatic activities and water safety programmes including: access due to distance or transportation; cost; culture and gender; language; and different priorities and values regarding water safety (Lifesaving Victoria 2011). These barriers may contribute to an increased risk of drowning in Australian aquatic settings.

Historically, Australian drowning prevention programmes for children under 5 years have focussed on four key factors: adequate supervision; barriers to control access to water; water familiarisation; and the ability of first responders to deliver cardiopulmonary resuscitation (CPR) (Royal Life Saving Society—Australia 2017a). In Western Australia, these strategies are delivered by the peak non-government organisation for drowning prevention via the *Keep Watch* programme—a state-wide, collaborative health promotion programme that aims to reduce the incidence of fatal and non-fatal drowning among children aged 0 to 4 years. By and large, the *Keep Watch* programme has been designed and delivered for English-speaking parents and carers of children. More recently strategies to reduce inequities for CaLD communities have been implemented that aim to address barriers to participation such as cost and access to culturally appropriate venues and programmes (Royal Life Saving Society WA 2017b, January 11).

Whilst there has been some Australian research into the use of water familiarisation programmes for people born overseas (Mahony 2017), there is limited literature on their knowledge of appropriate supervision practices and cardiopulmonary resuscitation (CPR). This paper compares differences in 1) perceived swimming ability; 2) knowledge of appropriate supervision; 3) participation in water familiarisation programmes; and 4) CPR training completion between those born in Australia and overseas in a Western Australian population.

Methods

Participants, sample selection and recruitment

A cross-sectional survey was conducted at four time points from 2014–2017 (October 2014 (T1), March 2015 (T2), March 2016 (T3) and March 2017 (T4)) in WA, with a convenience sample. Data were collected online and via intercept. At each time point, an invitation to participate and survey link was distributed via networks of the WA peak non-government organisation for drowning prevention and a related campaign Facebook page. Intercept surveys were collected at community events where the target group were known to attend, such as community fairs. The interviewer approached parents or grandparents attending the event, gained their consent to participate in the survey and invited them to self-complete either a paper-based or an electronic version of the survey.

Inclusion criteria required that participants be over the age of 18 and the carer of children under 5 years, residing in WA. The recruitment protocol required equal proportions of home pool owners or those with access to large

bodies of water and non-home pool owners, and 20% of the sample to be from regional and remote WA. Once data were cleaned and participants with missing variables were removed (n = 351), a final useable sample of complete data (n = 1506) was achieved. Sample sizes were T1 (n = 418); T2 (n = 250); T3 (n = 301) and T4 (n = 537).

Instrumentation and measures

Data were collected via an online survey using Qualtrics survey software (2017) (Qualtrics 2018) that took approximately 15 min to complete.

Demographics

Demographic variables included: country of birth, age, gender, postcode (used to categorise place of residence as either *Metropolitan* (postcodes 6000 – 6210) or *Regional* (postcodes 6211 – 6999) WA), carer status (parent, grandparent), number of children under 5 years of age cared for and level of education. Participants were categorised as 'migrants' if they identified their place of residence as a WA postcode only (since other locations within Australia were excluded from the survey) and identified their 'country of birth' as a location other than Australia (United Nations 2016).

Swimming ability and water familiarisation

Perceived swimming ability was determined by asking participants '*How many metres can you currently swim in a swimming pool without stopping or touching the bottom*?' The options were: *Can't swim; Less than 50 metres; 50 to 100 metres; 100 to 200 metres; 200 to 500 metres; and More than 500 metres*. These were dichotomised to: *swimmers (perceived)*—those who can swim more than 50 metres without stopping or touching the bottom; and *non-swimmers (perceived)*—those who can't swim more than 50 metres without stopping or touching the bottom. Water familiarisation was determined by one question, '*Have any of the children ever participated in a FORMAL water familiarisation, infant aquatics programme or mums and bubs water classes?'* Response categories were: *Yes*; *No* or *Don't know*. Participants who chose '*Don't know'* were excluded from the analysis.

Supervision

Supervision was determined by one question, '*In your opinion, what is the most appropriate method of supervision in and around water for children less than five years of age*…?' with answer options: *Within ARM'S REACH; Where I can SEE them; Where I can HEAR them.* Supervision was then dichotomised to '*Adequate*' (within arm's reach) and '*Inadequate*' (where I can see them or where I can hear them) according to international guidelines (International Life Saving Federation 2011).

CPR training

The CPR training question, '*Have you ever completed FORMAL resuscitation or CPR training*?' included response categories: *Yes, within the last 12 months; Yes, more than 12 months ago; No (have never completed CPR training)* and *Don't know*. For the purpose of logistic regression, CPR training was dichotomised to *'Adequate'* (completed CPR training less than 12 months ago, or more than 12 months ago) and *'Inadequate'* (never completed CPR training), in line with Australian guidelines, which no longer provide a recommended CPR refresher timeframe (Mancini et al. 2010). Participants who chose '*Don't know'* were excluded from analysis.

Data analysis

Analysis was undertaken at the completion of T4 data collection using SPSS (SPSS Version 25) (SPSS Inc 2017). Descriptive statistics summarised the demographic characteristics of the participants and CPR training completion rates. Associations between country of birth (migrant or Australia-born) and demographic variables (gender, age, place of residence, carer status, number of children cared for < 5 years old, education level) were determined using bi-variate Pearson Chi-squared test. P values < 0.05 were considered statistically significant.

Forced entry logistic regression was used to calculate odds ratios (OR) with 95% confidence intervals for the dichotomous outcomes: swim ability (*0 = non-swimmers (perceived); 1 = swimmers (perceived)*), water familiarisation *(0 = didn't attend, 1 = attended)* and supervision *(0 = inadequate, 1 = adequate)* and CPR training *(0 = inadequate, 1 = adequate)*. Australian-born and migrant categories along with demographic variables showing significant variation between Australian-born and migrant participants (Table 1) were included in the logistic regression models. P values < 0.05 were considered statistically significant.

Results

Demographics

Of the sample of 1506 participants, 70.7% were Australian-born (n = 1065). Migrant participants were significantly more likely to: be over 35 years of age χ^2 (3, N = 16.85,

Table 1 Demographics of Australian-born and migrant participants (Western Australia) 2014–2017

Total (n = 1506)	p value	Australian-born n (%)	Migrants n (%)	All n (%)
Gender[a]				
Male		57 (5.4)	31 (6.9)	88 (5.8)
Female		1008 (94.6)	410 (93.0)	1418 (94.2)
Age	< 0.001			
Under 25 years		42 (3.9)	5 (1.1)	47 (3.1)
25–34 years		566 (53.1)	205 (46.5)	771 (51.2)
35–44 years		377 (35.4)	188 (42.6)	565 (37.5)
45 + years		80 (7.5)	43 (9.8)	123 (8.2)
Place of residence	< 0.001			
Metropolitan		880 (82.6)	414 (93.9)	1294 (85.9)
Regional		185 (17.4)	27 (6.1)	212 (14.1)
Carer status	< 0.05			
Parent or carer		1007 (94.6)	404 (91.6)	1411 (93.7)
Grandparent		58 (5.4)	37 (8.4)	95 (6.3)
No. children aged < 5 cared for				
One child		659 (62.0)	280 (63.8)	939 (62.5)
Two children		361 (34.0)	137 (31.2)	498 (33.2)
Three or more children		43 (4.0)	22 (5.0)	65 (4.3)
Education level completed	< 0.001			
Did not complete year 12		88 (8.3)	13 (2.9)	101 (6.7)
Completed year 12		173 (16.2)	36 (8.2)	209 (13.9)
Trade certificate/diploma		299 (28.1)	97 (22.0)	396 (26.3)
University		505 (47.4)	295 (66.9)	800 (53.1)

[a]One respondent identified gender as 'other' and was excluded

$p < 0.001$); live in the Perth metropolitan area χ^2 (1, $N = 32.623$, $p < 0.001$); have attained a higher education level χ^2 (3, $N = 54.465$, $p < 0.001$); and be a grandparent χ^2 (1, $N = 34.573$, $p < 0.001$).Other demographic characteristics are shown in Table 1.

Swimming ability, supervision and water familiarisation

Table 2 shows the impact being a migrant had on perceived swimming ability, knowledge of appropriate supervision practice and access to formal water familiarisation. Migrants were less likely to perceive themselves as swimmers than those born in Australia (odds ratio [OR] = 0.45, 95% confidence interval [CI] = 0.35 – 0.58; $p < 0.001$), as were those aged over 45 years (OR = 0.36, 95% CI = 0.13 – 0.97; $p < 0.05$). However, those with a university education were more than two times as likely to consider themselves swimmers (OR = 2.23, 95% CI = 1.39 – 3.58; $p < 0.001$).

Migrants were less likely to choose 'Within arm's reach' as the most appropriate supervision practice (OR = 0.58, 95% CI = 0.41 – 0.84; $p < 0.005$), as were grandparents (OR = 0.34, 95% CI = 0.13 – 0.93; $p < 0.05$) and those with a university education (OR = 0.37, 95% CI = 0.14 – 0.96; $p < 0.05$). Females, however, were twice as likely to accurately identify 'Within arm's reach' as the more appropriate supervision practice (OR = 2.05, 95% CI = 1.13 – 3.72; $p < 0.05$).

Migrant participants were significantly less likely to have accessed water familiarisation classes for their children under 5 years of age (OR = 0.61, 95% CI = 0.47 – 0.79; $p < 0.001$) as were those from regional areas (OR = 0.67, 95% CI = 0.49 – 0.93). Age and education also influenced access to water familiarisation; those university-educated and aged over 45 years were more than twice as likely to have accessed water familiarisation for their children under 5 years of age ([University] OR = 2.15, 95% CI = 1.36 – 3.40; $p < 0.01$; [Over 45 years] OR = 2.69, 95% CI = 1.25 – 5.76; $p < 0.005$).

CPR training completion

Overall, 25% of all participants had completed CPR training in the last 12 months (n = 371), 57% completed training more than 12 months ago (n = 857) and 18.3% had never completed CPR training (n = 275) (not shown). As indicated in Table 2, migrants were less likely to have completed any CPR training than those born in Australia

Table 2 Odds ratio for swimming ability, water familiarisation, supervision and cardiopulmonary resuscitation training (Western Australia 2014–2017)

Total (n = 1506)	Swim ability Model 1			Water familiarisation Model 2			Supervision Model 3			CPR training Model 4		
Characteristics	OR (95% CI)	SE	p	OR (95% CI)	SE	p	OR (95% CI)	SE	p	OR (95% CI)	SE	p
Country of Birth												
Australian born	1.0			1.0			1.0			1.0		
Migrant	0.45 (0.35–0.58)	0.133	*0.000*	0.61 (0.47–0.79)	0.132	*0.000*	0.58 (0.41–0.84)	0.186	*0.004*	0.34 (0.24–0.47)	0.170	*0.000*
Gender												
Male	1.0			1.0			1.0			1.0		
Female	0.58 (0.33–1.02)	0.283	0.057	0.80 (0.47–1.36)	0.269	0.420	2.05 (1.13–3.72)	0.273	*0.018*	0.38 (0.17–0.87)	0.271	*0.022*
Age												
Under 25 years	1.0			1.0			1.0			1.0		
25–34 years	0.68 (0.31–1.51)	0.404	0.350	1.22 (0.66–2.27)	0.317	0.528	1.43 (0.49–4.18)	0.549	0.518	1.18 (0.53–2.63)	0.408	0.682
35–44 years	0.58 (0.26–1.28)	0.409	0.178	1.56 (0.83–2.95)	0.325	0.169	1.18 (0.40–3.49)	0.553	0.831	1.65 (0.72–3.77)	0.422	0.235
45 + years	0.36 (0.13–0.97)	0.512	*0.043*	2.69 (1.25–5.76)	0.389	*0.011*	1.51 (0.37–6.26)	0.72	0.566	1.22 (0.39–3.87)	0.587	0.729
Carer status												
Parent	1.0			1.0			1.0			1.0		
Grandparent	1.02 (0.49–2.10)	0.370	0.961	0.75 (0.32–1.74)	0.431	0.500	0.34 (0.13–0.93)	0.509	*0.036*	0.66 (0.26–1.69)	0.475	0.390
Education												
Didn't complete year 12	1.0			1.0			1.0			1.0		
Completed year 12	1.70 (0.99–2.92)	0.275	0.053	1.12 (0.67–1.86)	0.259	0.660	0.56 (0.19–1.63)	0.543	0.288	1.81 (0.99 –3.30)	0.305	0.051
Trade/diploma	1.36 (0.83–2.20)	0.248	0.219	1.45 (0.90–2.32)	0.241	0.124	0.46 (0.17 –1.24)	0.503	0.125	3.92 (2.19–7.01)	0.296	*0.000*
University	2.23 (1.39–3.58)	0.243	*0.001*	2.15 (1.36–3.40)	0.235	*0.001*	0.37 (0.14 – 0.96)	0.494	*0.042*	4.71 (2.70–8.22)	0.284	*0.000*
Place of residence												
Metropolitan	1.0			1.0			1.0			1.0		
Regional	1.27 (0.87–1.85)	0.192	0.208	0.67 (0.49–0.93)	0.163	*0.015*	0.97 (0.57–1.65)	0.273	0.905	1.93 (1.14–3.28)	0.271	*0.015*

Significant p values are denoted in italics

CPR Cardiopulmonary resuscitation, *OR* odd ratio, *CI* confidence intervals, *SE* standard error

(OR = 0.34, 95% CI = 0.24 – 0.47; $p < 0.001$). Women were less likely to have completed CPR training (OR = 0.38, 95% CI = 0.17 – 0.87; $p < 0.001$), whilst those with a trade diploma or university degree were four times as likely to have completed CPR training (OR = 3.92, 95% CI = 2.19 – 7.01; $p < 0.001$); (OR = 4.71, 95% CI = 2.70 – 8.22; $p < 0.001$), respectively.

Discussion

This study compared the differences between parents and carers born in Australia and migrants now living in WA for perceived swimming ability, knowledge of appropriate supervision, participation in water familiarisation programmes and completion of CPR training. Country of birth had an effect on variations in all dependent variables, after controlling for demographic variations in Australian-born and migrant participants. The differences observed involved three out of the four central and targeted prevention factors for drowning prevention in infants and toddlers, i.e. adequate supervision, water familiarisation and the ability of first responders to deliver CPR (International Life Saving Federation 2011). These findings highlight the need for drowning prevention organisations to consider the delivery of their messages to migrants. Barriers previously identified (Lifesaving Victoria 2011; Royal Life Saving Society—Australia 2012) indicate that more culturally tailored, low-cost and easy access programmes and strategies for diverse segments of the Australian population will be of benefit.

Those born in Australia were more likely to perceive themselves to be 'swimmers'. Of interest, there has been little research into the impact parent swimming ability has on childhood drowning prevention. One New Zealand study examined parents' swimming ability on their perceived ability to rescue their children in an emergency (Moran 2009). This research found children of parents who reported lower swimming ability might be at greater risk of drowning at the beach, because parents would be less likely to be able to cope with near drowning incidents and dangerous water conditions (Moran 2009). Australian-born caregivers were also more likely to identify appropriate supervision as 'Within arm's reach'. This guideline is promoted as a safe distance for supervision by drowning prevention agencies (International Life Saving Federation 2011). It is difficult to gauge the impact parent swimming ability may have on supervision practice from the findings of the current study; however, we may posit, parents with low swimming ability may be less likely to get in the water with their children.

This study found that Australian-born participants were more likely to have completed CPR training, even after controlling for the significantly higher education levels in migrant participants. However, only one-quarter of all participants had completed CPR training in the last 12 months. Given that skills may deteriorate within three to six months of training completion (Mancini et al. 2010), this is a concern. This finding suggests efforts are required across the sector to ensure all parents of children aged under 5 years, irrespective of their place of birth, understand the importance of up-to-date CPR skills. This supports key objectives in the national strategy with regard to drowning prevention in children 0 - 4 years, which highlights community wide rescue and resuscitation skills as a priority (Australian Water Safety Council 2016).

The Australian Water Safety Council identifies water familiarisation as a core action to prevent childhood drowning (Australian Water Safety Council 2016). Migrant participants in this study were significantly less likely to have accessed formal water familiarisation classes for their children aged under 5 years. This finding is consistent with other Australian research where children aged 5 – 14 years with parents born outside of Australia were also less likely to participate in swimming lessons (Lifesaving Victoria 2011; Mahony et al. 2017; Royal Life Saving Society—Australia 2012). Future drowning prevention strategies require dedicated resources and segmentation of target groups by culture, language and health literacy to enhance migrant access to formal water familiarisation.

It is important to recognise the plethora of challenges faced by migrants (Gushulak and MacPherson 2006), especially those who are newly settled. Drowning prevention in children may not be at the forefront of parents' minds, especially if they are not yet aware of the increased risk faced in the Australian context. Health promotion theories such as the Health Belief Model (Rosenstock 1974) indicate that this knowledge is required as a precursor to confidence to action and then to action. Strategies that work in partnership with established community groups may further increase knowledge and awareness about water safety, attitudes and behaviour with regard to preventing toddler drowning in the Australian context for migrant populations, as seen in other interventions involving sexual health (Drummond et al. 2011), physical activity (Caperchione et al. 2009) and injury prevention (Brewin and Coggan 2004).

These finding indicate a variation in Australian-born and migrant participants in the four core pillars for childhood drowning prevention. In order to gain a more comprehensive picture in the Australian setting, it is recommended that future research into drowning prevention in children under 5 years with migrant parents, collects more robust data regarding the demographics of participants, including how long they have lived in Australia, country of birth, their migration experience and English language

proficiency. Exploring attitudes and knowledge in relation to behavioural theory will support the development of more sophisticated, comprehensive and salient drowning prevention strategies (Denehy et al. 2017; Leavy et al. 2017) for migrants and CaLD populations.

To our knowledge, this is one of the first studies to explore the differences in knowledge of appropriate supervision practices, completion of CPR training and water familiarisation between those born in Australia and overseas. The study has a number of limitations. Self-report data were used which may be subject to social desirability bias (Krumpal 2013), and the recruitment protocol relied on a convenience sample, meaning it may not be representative of the population as a whole (Fricker 2008). The length of time migrants had lived in Australia and subpopulations were not categorised, meaning participants may not be representative of migrants overall in WA. The survey was self-administered, requiring the ability to read and write in English. There was also an overrepresentation of Australian-born participants (70.7%) when compared to the overall Australian-born population estimates in WA (60%). In addition, data were only collected from one Australian jurisdiction, which limits generalisability. It does, however, offer some insight into differences between Australian-born and migrant participants that warrant further exploration.

With migration increasing in WA, it is essential that drowning prevention messaging is target group specific, recognising the heterogeneity of migrant populations with regard to language, culture and health literacy (Adedimeji et al. 2015; Agu et al. 2016). Using existing migrant community networks, community leaders and peer led education to highlight the Australian water context may assist to get drowning prevention on the agenda in migrant communities; strategies that had shown utility in health promotion interventions with other health issues (Henderson and Kendall 2011). Policy makers, practitioners and researchers each have a role to play in increasing the focus on and improving service delivery to priority migrant groups to reduce drowning risk, particularly for children.

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Compliance with ethical standards

Ethical approval This study was approved by the Curtin University Human Ethics Committee (Approval No. HR201/2014).

Conflict of interest LN was responsible for the delivery of and securing future funding for the child injury prevention intervention described in this study. There are no other conflicts of interest to declare.

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