

ORIGINAL ARTICLE

Will They Swim or Sink? Parental Perception of Water Safety Among Their Children

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ABSTRACT

Introduction: The magnitude of drowning as one of the leading causes of death among children in Malaysia may have been underestimated. Little is known on the level of awareness on water safety among parents as it might be associated with appropriateness and adequacy of the supervision. This study aims to describe perceptions of water safety among parents of primary school children. **Methods:** A cross-sectional survey with 719 respondent conducted to obtain information on parents self-reported on their children's water-involved activity and swimming ability, self-estimated ability to rescue their child and perceptions of the risk of drowning and water safety for their children. **Results:** The result revealed that about 21.6% of respondents did not perceive drowning as one of the unintentional injury leading causes of death among children. Parents reported that their children had experienced a near-drowning incident (16.1%), and only 12.2% of the child had attended a formal swimming lesson. Majority of the parents did not involve in any water safety program (98.7%), can't swim (61.6%), not been certified in CPR (87.3%) and not confident (87.3%) to perform resuscitation (CPR). Respondents also perceived their children could swim (42.1%), and they felt confident when their child in the water (45.6%). There were statistical differences between parents who reported their child had a near-drowning experience with their perception of children's swimming ability. **Conclusion:** An exploration of parent's perception of water safety provided an overview of the need for promoting awareness on drowning risk and water safety education in this country.

Keywords: Drowning prevention, Water safety, Childhood drowning

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INTRODUCTION

Worldwide, drowning causes significant health issues and giving an ongoing challenge for its preventive measures notably in a Low and Middle-Income Countries (LMIC); where the drowning deaths rates encounter the vast majority (98%) (1). In Asia, with highlighted on children, drowning caused about half of all injury related-death among young citizens and continuously reported to contribute tremendous burden health issues (2,3). Malaysia with an estimated 3.05 per 100, 000 of national drowning death rate in children (4) was computed to have a lower death rate compared to most other South East Asia countries. Malaysia children drowning death rate was below the global rate as compared to neighbouring countries such as Cambodia (16.01), Vietnam (10.98), Thailand (10.84) and many more (5). However, this may still be due to underreporting and no comprehensive drowning registry

available yet, which created discrepancies in the overall drowning rates for the country (1, 3). Nevertheless, a report in 2011 (6) accentuate the magnitude of drowning in Malaysia as one of the leading causes of death among children and unenviable has placed this country among others South East Asia countries that shared the same burden on unintentional injury due to drowning (4, 7). Locally, the study reported most drowning took place in Kelantan and Terengganu; the east coast regions of Peninsular Malaysia with the most prevalent sites were rivers and seas (6). On top of that, in 2016, the Department of Fire and Rescue revealed Selangor to have highest mortality drowning rate for a statistic data of from the year 2012 – 2015 (8).

People perception on the risk either in the cognitive dimension; relates on how much they know about and understand the risk or in emotional aspect; relates on how they feel about the threat, play a key role in their behaviour (9,10). Previous studies reported low-risk perceptions on drowning either among parents, guardians or people in the community (11–14). Low-risk perceptions on drowning showed an association with risky behaviour, overestimated on the swimming ability

(12) and might have an impact on the supervision of the guardian or caregiver (14). Inadequacy on surveillance might have resulted in parents or guardian, or caregiver perceived drowning as not risky or a severe problem (11,13). Parental belief as drowning is accidents and thus could not be prevented, may also influence the low perceptions among them (11,15). Perception of parents or caregiver as injury were ineluctable part of child development also might be resulted as a barrier to injury prevention (16,17).

Lower risk perceptions were found significant with drowning therefore, an approach on water safety focusing on risk evaluation and skill were suggested to impede the issues in young beachgoers in New Zealand (12). An intervention for a community with aimed to change their attitude, increase awareness and develop children swimming skill was suggested to increase childhood drowning prevention in Thailand (11). Other study presented that parents with past experiences of near-drowning events enhanced the awareness of drowning risk and the need for close supervision of their children (18,19). Thus, we believed that improving awareness and perceptions related to drowning risk might be critical in preventing mortality in childhood drowning death. Finding on exploring people perceptions of risk and their supervisory practice on water safety could develop an essential message to promote awareness, considering changing their attitude towards drowning risk, influence safer behaviours and improving skills. It also postulated to be useful information in developing intervention programs for water safety and drowning prevention.

Drowning in Malaysia still did not receive ample attention, especially with regards to children. Very minimal studies were conducted in related to drowning in this country and a major ignorance of the reality on this issues might due to very limited data available on drowning incidents, lack of information on the mechanism of the drowning events and little is known on people perceptions related to drowning risk. Hence, this study aimed to examine drowning risk perception and the water safety of parents of primary school children in Malaysia. This study was hoped to provide us with information on the current level of parental water safety and will help us in understanding more on the drowning issues related to children in this country. The findings of the study also could be useful in designing and developing drowning prevention and water safety intervention and might increase the effectiveness of interventions.

MATERIALS AND METHODS

Study area

Selangor was reported to have highest mortality drowning rate in Peninsular Malaysia (a statistic data

from the year 2012 – 2015) by Department of Fire and Rescue, thus one of the district (Hulu Langat) in this state was selected as a target community.

Respondents and recruitment

Parents of children from a simple random selected primary school in Hulu Langat district were invited to participate in the study. Cooperation and collaboration with school teachers were gained to deliver a message to parents on conducting the survey. There was no obligation by parents to participate and written consent obtained from a respondent who is willing to participate. The questionnaire for parents were delivered by children and were returned back either directly to the researcher or the class teacher.

Study instruments and measures

Parents of primary school children were invited to complete a brief, self-administrated questionnaire related to their children's water safety and water activity. A validated self-administrated questionnaire consisted of questions on socio-demographic, self-reported swimming ability and activity of their children by parents, the frequency of bringing children to swim, competencies on water safety, a self-reported child near-drowning experiences, drowning risk perceptions and water safety were used as a study instrument (20). The socio-demographic measures in the survey provided information on the parents and their children with related to factors of drowning risk including; age, gender, ethnicity, place of residence, parent's education background, household income and a number of children.

The questions comprised of types of activities involving water, frequencies of bringing child to swim in a year, place their child often went for swimming, child's swimming lesson, child's swimming ability and competencies ranging from cannot swim, to more than 50 meter, child's ability to put the whole body including head into water, child's ability to float from none to more than 3 minutes, child's ability to jump into the water independently, who teaches/taught their child to swim and does parents/guardian's feel confidence when their child in water. The survey also sought information on parents/ guardian's self-reported regarding life-threatening child submersion or near drowning experience. Questions on water safety competencies required parents to respond yes or no as to whether they had participated in any water safety program, were certified in CPR and whether they feel the confidence to perform the CPR. Questions on drowning risk perceptions and water safety sought information on parental/guardian perceptions of on children's susceptibility to drowning and water safety measures using dichotomous response; yes or no and a 5-Likert scale (5= strongly agree, 4=agree, 3=uncertain, 2 = disagree, and 1=strongly disagree).

Ethical consideration

Ethical approval was obtained from Research Ethics Committee, The National University of Malaysia (UKM PPI/111/8/JEP-2016-594) and supported by Ministry of Education Malaysia (MOE). Written informed consent was sought from each respondent involved in this study.

RESULTS

A total of 770 parents of primary school children were invited to participate in this study, 719 completed the survey with a 93.4% response rate. The socio-demographic characteristic of participants presented in Table I. Majority of the respondent were Malays (94.6%), females (56.3%) and the mean age was 41.42 years. The number of children in one family range between 1 to 11 with 52.29% girls and 47.71% boys. The mean household income was RM 5167.01 (approximately RM4: 1 USD).

Water-involving activities and children's swimming ability

Most of the parents (66.8%) provided information that during past 12 months prior to the survey, they and/or their children have participated in water-involved activities such as swimming, fishing, boating, canoeing, diving and others (Fig.1). More than half (63.49%) were involved in swimming activities, and 71.3% claimed, they brought their child to swim. The highest frequencies of bringing their child/children to swim were about 1- 4 times a year (44.6%).

Self-reported information on children's swimming ability indicated that almost half of respondents perceived their children can swim (42.1%); with 78.9% claimed their children could swim less than 25meters, 18.8% can swim between 25 to 50 meters and 12.2% can swim more than 50 meters. They also reported their children could float in the water (48.1%); with 49.7% said their children could float less than 1 minute, 34.7% can float 1 to 2 minutes and 28.6% can float more than 3 minutes. Majority of respondents also thought that their children could put the whole body (including head) under the water (59.4%) and can jump into the water independently (55.6%). About 45.6% of parents responded that they felt confident when their children in the water.

In the survey, 16.1% of parents reported that their children had experienced a near drowning incident. There were statistical differences between near-drowning experiences with the self-estimated swimming ability of children. Those who have a child with near drowning experiences reported the significantly higher proportion of self-estimation on their children swimming ability (Table II).

Parents perceptions of drowning risk and water safety Majority of the parents agreed that drowning among

Table I: Characteristics of parents enrolled in the study (N=719)

Variable	n	%	Mean ± SD
Age			41.42 ± 6.097
Ethnicity			
Malay	680	94.6	
Chinese	5	0.7	
Indian	11	1.5	
Others	23	3.2	
Relationship with children			
Father	308	42.8	
Mother	390	54.2	
Guardian	19	2.6	
Other	2	0.3	
Educational level			
No schooling	5	0.7	
Primary school	27	3.8	
Secondary school	309	43.0	
Certificate/ Diploma	177	24.6	
Degree	160	22.3	
Master and above	41	5.7	
Occupation			
Not working	20	2.8	
Housewife	144	20.0	
Self-employed	88	12.2	
Government sector	198	27.5	
Private sector	257	35.7	
Others	12	1.7	
Household income			
RM 5000 or less	416	57.9	
RM 5001 and more	303	42.1	
Do you have a swimming pool at home?			
Yes	45	6.3	
No	674	93.7	
Referring to your current address, is there any open water sources nearby (<1km) (e.g.: ditches, river, sea, lake, pond, etc.)			
Yes	393	54.7	
No	326	45.3	
Do you live in a flood-risky area			
Yes	69	9.6	
No	650	90.4	

children is predictable and preventable (81.6%), and aware that every child is at risk of drowning (84.6%). However, about one fifth (21.6%) of respondents did not realize that drowning is one of the unintentional injury leading causes of death among children in Malaysia. Significant differences reported in the gender of Parents on perceptions of drowning as one of the unintentional injury leading causes of death among children (χ^2 (1, N=719) = 6.845, $p \leq 0.05$). The parental/guardian's educational background also showed differences in the perceptions of every child is at risk of drowning (χ^2 (1, N=719) = 3.979, $p \leq 0.05$).

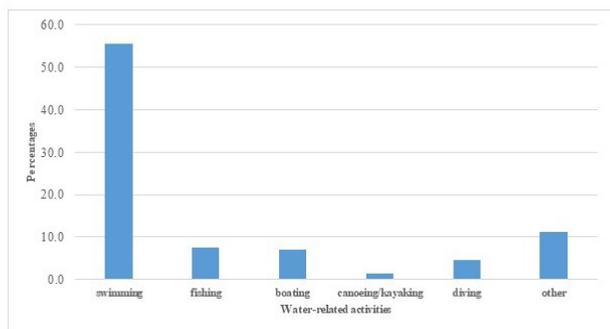


Figure 1: Parents and children's water-related activities

Table II: Self-estimated on children's swimming ability by near drowning experiences

	Frequencies, n (%)	Near drowning experiences		χ^2	p
		No, n (%)	Yes, n (%)		
Children can swim?					
No	416(57.9)	374(62.0)	42(36.2)	26.592	0.000
Yes	303(42.1)	229(38.0)	74(63.8)		
Children can float?					
No	373(51.9)	335(55.6)	38(32.8)	20.252	0.000
Yes	346(48.1)	268(44.4)	78(67.2)		
Children can put whole body in water?					
No	292(40.6)	274(45.4)	18(15.5)	36.114	0.000
Yes	427(59.4)	329(54.6)	98(84.5)		
Children can jump into water independently?					
No	319(44.4)	293(48.6)	26(22.4)	27.007	0.000
Yes	400(55.6)	310(51.4)	90(77.6)		
Feel confident when children in water?					
No	394(54.8)	350(58.0)	44(37.9)	15.887	0.000
Yes	325(45.2)	253(42.0)	72(62.1)		

As for water safety measures, most of the respondents perceived swimming skill and CPR skill among Parents is essential for drowning prevention (Table III). However, only small percentages of parents claimed that their child had attended a formal swimming lesson (12.2%) and only 7.5% responded that their child learns how

to swim from a swimming instructor. More than a third of respondents (37.0%) reported that no one teaches/taught their child/children to swim, 42.6% by fathers, 4.2% by mothers, 1.5% by both parents and the 6.0% by other family members such as uncles, aunts, siblings and so on. About 0.8% of respondents also claimed that their child/children had been taught to swim by their child's peers and 1.4% claimed their child/ children self-learned how to swim.

Most of the parents had not certified (87.3%), not confident (87.3%) to perform cardio-pulmonary resuscitation (CPR) and only 38.4% of respondent reported that they can swim. Majority of them also did not involve in any water safety program (98.7%). From the survey, 65.8% of parents claimed ever to see, hearing or reading any advertising messages on water safety in the last six months. However, only 38.7% of respondent reported can be recalled what they had heard, read or seen.

Acquisition in resuscitation skill (CPR) was showed to have significant statistical differences in some of the socio-demographic background, involvement in water-related activities, receiving water safety messages and ability to swim among parents (Table IV). In contrast, having a pool at home or live close to open-water resources or in a flood-risk area also did not have any statistical differences in parents that certified in CPR. However, parents who lived close to open-water resources and working were formulated a significant difference in confident of performing a resuscitation (CPR) ($\chi^2 (1, N=719) = 4.353, p \leq 0.05$).

DISCUSSION

This study revealed positive responses of the parent's perceptions on drowning risk. Majority of parents showed awareness of drowning risk and most of them have a high educational background that may influence perceptions that every child is at risk of drowning. However, some still did not perceive drowning as

Table III: Number and percentages of water safety perceptions among parents

	Strongly disagree		Disagree		Uncertain		Agree		Strongly agree		Mean (SD)
	n	%	n	%	n	%	n	%	n	%	
All parents should know water safety measures	12	1.7	5	0.7	19	2.6	243	33.8	440	61.2	4.52 (0.74)
All parents should learn how to swim	6	0.8	31	4.3	95	13.4	329	45.8	257	35.7	4.11 (0.85)
Ability to perform resuscitation (CPR) among Parents can reduce the risk of drowning on children	6	0.8	22	3.1	72	10.0	338	47.0	281	39.1	4.20 (0.81)
Resuscitation (CPR) might save the lives of drowning victims	3	0.4	6	0.8	54	7.5	325	45.2	331	46.0	4.36 (0.69)
All parents should learn CPR	3	0.4	8	1.1	82	11.4	325	45.2	301	41.9	4.27 (0.74)
Every parents should know the contact number of emergency to call when encounter a drowning incidents	3	0.4	10	1.4	12	1.7	241	33.5	453	63.0	4.57 (0.64)
Not all children need to learn how to swim	191	26.6	269	37.4	131	18.2	104	14.5	24	3.3	2.31 (1.11)

Table IV: Selected demographic and self-reported of water safety competencies by certified in CPR among parents

	Frequencies, n (%)	Certified in CPR		χ^2	p
		No n (%)	Yes (%) n		
Household income				8.947	0.003*
RM5000 or less	416(57.9)	376(60.0)	40(43.5)		
RM5001 or more	303 (42.1)	251(40.0)	52(56.5)		
Occupation status				11.936	0.001*
Not working/ housewife	164(22.8)	156(55.6)	8(8.7)		
Working	555(77.2)	471(75.1)	84(91.3)		
Do you have a swimming pool at home?				0.328	0.567
No	674 (93.7)	589(93.9)	85(92.4)		
Yes	45(6.3)	38(6.1)	7(7.6)		
Referring to your current address, is there any open water sources nearby (<1km) (e.g.: ditches, river, sea, lake, pond, etc.)				2.267	0.132
No	326(45.3)	291(46.4)	35(38.0)		
Yes	393(54.7)	336(53.6)	57(62.0)		
Do you live in a flood-risky area				0.481	0.488
Yes	650(90.4)	565(90.1)	85(92.4)		
No	69(9.6)	62(9.9)	7(7.6)		
Involved in water-related activities					
No	239(33.2)	221(35.2)	18(19.6)	8.891	0.003*
Yes	480(66.8)	406(64.8)	74(80.4)		
Received water safety messages?					
No	246(34.2)	223(35.6)	23(25.0)	3.979	0.046*
Yes	473(65.8)	404(64.4)	69(75.0)		
Can recalled on water safety message?					
No	441(61.3)	401(64.0)	40(43.5)	14.185	0.000*
Yes	278(38.7)	226(36.0)	52(56.5)		
Can swim?					
No	443(61.6)	403(64.3)	40(43.5)	14.670	0.000*
Yes	276(55.6)	224(35.7)	52(56.5)		
Confident to perform CPR?					
No	628(87.3)	599(95.5)	29(31.5)	297.381	0.000*
Yes	91(12.7)	28(4.5)	63(68.5)		

*p value significant <0.05

one of the leading causes of death among children, whereas the previous study was reported drowning as a second highest on the volume of deaths among children in Malaysia (4) . Many studies also highlighted that drowning as one of the common causes of death among young children in many Asia countries (1,21,22) . Males postulated lower perceptions consistent with the results of other studies that indicate the possibility of the men to underestimate drowning risk (14,23).

Parents also reported agreeing on the beneficial of the water safety competencies such as resuscitation skill (CPR) and swimming skill. On the other hand, it decidedly contradicted with the finding that most of the respondents did not certify with a resuscitation (CPR) skill and not confident of performing a CPR. Acquisition of CPR skill was found associated with family income. This might be one of the barriers to water skill among parents, as learning CPR might involve with some cost.

Respondents who were working and not working or housewife also showed significant differences in getting certified CPR. As we can postulate that most of the respondents were employed (especially in government sectors), thus they might have received their training in first aid and CPR at their workplace. Receiving water safety messages also were found influenced some of the parents to learn resuscitation (CPR). Thus, encouraging to learn CPR and offering free CPR and first aid instructions to the community might benefit from increasing water safety awareness and help in drowning prevention. This suggestion was consistent with other studies that had reported that the majority of caregivers who did not know CPR, expressed interested in taking a free CPR course (24).

Parent’s perceptions on their children competencies in swimming might associate with the perception of ability to cope with the drowning risk. As seen in the result,

most parents perceived their children could swim, float, jump into the water independently and put their whole body including head into the water. Many of them also feel confident when their child in the water. This finding may inform that parents were overestimated their children swimming skill as shown in the result on those with the near drowning experiences showed a higher proportion of self-estimation on their children swimming ability. An overestimated in swimming ability suggested in many previous studies that associated with lower perceptions on the risk of drowning and misbelief it was a more appropriate solution to prevent drowning among children compared to adult supervision (12,14,25). On top of that, very minimum parents send their children for a formal swimming lesson, and less than 10% learn to swim from an experienced swimming instructor. Majority of their children were reported to learn how to swim from either parent, family members, friends or tried by themselves. Lack of knowledge and skill on water safety and drowning prevention might result in a higher risk of drowning in children. This is supported by studies in Thailand where informal developing of swimming skill by rural children who were taught by peers or self-learned were contributed to a high number of drowning among children (11).

Overall, findings in this study accentuate the need to strengthen the messages on drowning risk and water safety. Drowning preventive measures such as proper and adequacy in supervision, first aid and lifesaving, water safety awareness and swimming skill should be contemplated as very important for parents in preventing drowning among children. Further study is required to consider research on intervention and water safety program that is well structured, cost-effective, high coverage and successful in drowning prevention focusing on children.

This study has some limitations as it only involved parents in public primary schools; thus it might ensuing in lack of generalisation. The sample population is also diverse from our population demographics as fewer Chinese and Indian people taking part in the study. Therefore, the results obtained should be considered in respect of several limitations and to generalize the result for larger groups, the study should have involved more participants at different levels (by a household survey). The self-reporting on near drowning and life-threatening incidents might be underreported because some children might involve in water activities with their peers without knowledge of their parents. Further investigation should include face to face interviews with both parents and also their children.

CONCLUSION

This study emphasises that most of the parents of primary school children in Hulu Langat, Selangor reported to lack of water safety competencies and

despite their awareness on beneficial of swimming skill and resuscitation as preventive measures for drowning prevention, there might be some barriers to develop the water safety skill and knowledge. Promoting on water safety and increasing the level of perceptions on the risk might be crucial in influencing the attitude of parents towards developing a safe behavioural. An exploration of parent's perception of water safety and drowning risk may partly explain the drowning episode among children and provided an overview of the need for promoting awareness on drowning risk and water safety education. This study also was hoped to be useful in providing information and the needs in developing an intervention to enhance drowning prevention intervention programs in this country thus will reduce the burden of child mortality and morbidity on drowning as a result. The initiatives on the drowning prevention strategy might accentuate the importance of parental supervision and their roles in providing water safety protection and drowning prevention for their children and consider addressing the proclivity of parents to overestimate their children's swimming skill.

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