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Students' Perception of Water Safety Education: A Case Study in Selangor, Malaysia

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Abstract

The safety of children near water is crucial to avoid drowning, a major cause of death among children worldwide. Drowning incidents are a significant issue in Malaysia, especially among young people. The greatest obstacle to the development of policy for water safety among school children is lack of awareness or knowledge of water safety. This study represents an attempt to measure attitudes towards waters safety and risk of drowning in the District of Gombak in Malaysia. Given the urgency of the matter, immediate attention and action are required. Therefore, this paper seeks to highlight the pressing nature of water safety concerns among school children and assess whether implementing a water safety education program can substantially enhance knowledge levels, thus reducing drowning incidents among children. Yet, drowning in Malaysia still doesn't get enough attention. The sample of the study was 502 school children from a school in the district in Selangor. Purposive sampling was selected. The major findings that emerged were as below: a) the respondents prefer to swim alone. b) They are less favor in of wearing life jackets. c) They prefer to swim without having adults around them. d) They are prone to swim without learning to swim. e) No association between students' attitudes towards water safety and sex. The urgency of this research is to address water safety issues among school children.

Keywords: water safety, education, drowning, schools, children

Background

The safety of children in and around water is critical to prevent drowning, which is a significant cause of mortality among children globally. Drowning accidents are a serious concern in Malaysia, particularly among children and adolescents. According to statistics from the Department of Occupational Safety and Health (DOSH) in Malaysia, drowning is one of the leading causes of unintentional injury-related deaths in the country. Here are some key facts about drowning accidents in Malaysia: *High Incidence:* Drowning incidents are relatively common in Malaysia, with drowning being the top cause of death for children aged 1 to 18 years. Drowning can happen in a variety of places, including swimming pools, rivers, lakes, ponds, reservoirs, and beaches. *Children and Adolescents are Particularly Vulnerable:* In Malaysia, children and adolescents are particularly vulnerable to drowning incidents. Lack of supervision, insufficient swimming skills, and insufficient safety precautions are all factors that contribute to drowning accidents involving children and adolescents.

Open Water Drowning: Open water drowning, such as rivers, lakes, and beaches, is a common type of drowning in Malaysia. Strong currents, uneven terrain, a lack of lifeguards or safety equipment, and a lack of water safety awareness can all enhance the danger of drowning in open water. *Inadequate or Inadequate Barriers and Safety Measures:* Inadequate or ineffective barriers around swimming pools, such as the absence of fences, self-latching gates, or pool coverings, might lead to drowning events in Malaysia. The absence of suitable safety precautions, such as life jackets or personal flotation devices (PFDs), can further increase the danger of drowning in open water or while participating in aquatic activities. *Lack of Water Safety Education:* Inadequate water safety awareness and education, including swimming abilities and drowning prevention, can also contribute to drowning events in Malaysia. Many people, particularly children and teenagers, may lack the information and abilities needed to identify and respond to water risks and crises.

Rural and Urban Disparities: Drowning incidents in Malaysia may differ between rural and urban locations. Drowning events in natural water bodies, such as rivers and lakes, may occur in rural regions because of agricultural and leisure activity. Drowning occurrences in urban settings may occur in swimming pools or other man-made water bodies due to inadequate safety measures or a lack of supervision. *Tourism and Recreational Activities:* The popularity of Malaysia as a tourist destination, with its stunning beaches and aquatic attractions, raises the risk of drowning incidents. Recreational activities such as swimming, snorkeling, diving, and boating can be dangerous, especially for those who are unskilled or untrained. In Malaysia, efforts should be focused on increasing water safety education,

implementing proper safety measures, strengthening supervision, raising awareness, and providing adequate resources and infrastructure, particularly in open water areas and recreational facilities. Collaboration among government agencies, NGOs, communities, and individuals is critical to addressing the issue of drowning incidents and ensuring the safety of Malaysians, particularly children and adolescents, in and near water.

Unfortunately, in Malaysia, drowning still doesn't get enough attention, especially when it comes to children. An estimated 236,000 individuals drown each year globally. Selangor was reported to have highest mortality drowning rate in Peninsular Malaysia based on a statistic data from the year 2012 – 2015) as reported by the Department of Fire and Rescue (Noor Hamzani, Rosnah, Kulanthayan, 2020). Recently, the Fire and Rescue Department showed that of the 1,437 water mishap cases reported from 2017 to July 2021, a total of 1,121 people died from drowning, while the remaining were rescued (injured and non-injured). This supported by NST report in 2019 whereby, the National Water Activity Safety Council (WASC) listed 15 high-risk places and 39 problematic areas around the country, noting that most events happened at rivers, canals, beaches, lakes, mining pools, waterfalls, and sewage. Additionally, on average 286 (range 248-344) children died annually due to drowning with a death rate of 3.05 per 100,000 annually as posited by Amar-Sing, Tan, Lina (2014). An additional average of 207 children drowned but survived annually (1.99 per 100,000). In fact, according to research conducted in Malaysia by the Perak Clinical Research Centre, 500 people, largely children, drown there every year, making it the second leading cause of death for those between the ages of 1 and 18. More than three times as many people drown each year in low-middle income countries like Malaysia as in middle-income country. Public awareness on water safety is still low, with 300 cases of drowning recorded in the past year, showing that death rate in water is higher than that of by fire with 130 deaths (NST, 2023).

According to The World Health Organization (WHO), the poor and marginalized groups, which have the fewest means to adjust to the risks surrounding them, are more susceptible to drowning. Relatively little research has been done on drowning in this country, and the lack of information on the causes of drowning events. Besides, the lack of knowledge about public perceptions of the risk may be contributing to the general lack of awareness of the situation as posited by Noor Hamzani, Rosnah, Kulanthayan KC Mani (2020). Additionally, a case-control study in the U.S. found a positive association between swimming lessons and lower drowning risk in children less than five years of age (Brenner, Taneja, Haynie, Trumble, Qian, Klinger et al., 2009). Importantly, according to Moran (2006), young people's

theoretical comprehension of water safety concepts and knowledge is one of the least studied study fields, and what can be inferred from published studies is that young people lack this understanding. Studies on water safety education are also inadequate, in addition to people's knowledge of water safety principles and practices. This is also supported by Erinn (2010) that it is yet unknown what variables motivate parents to make sure that their children learn to swim, even though improving swimming skills is a crucial preventive measure in reducing juvenile drowning. Similarly, research on water safety education is still lacking in literature (Turgut, Yaman, & Turgut, 2016). This has called for greater research on water safety education since little is known about the nature and extent of water safety among children and teenagers at school. This urgent situation demands prompt attention and action. Therefore, this paper aims to address the urgency of water safety issues among school children and examine whether a water safety education program can significantly increase the knowledge levels about water safety to help drowning victims among children.

Literature Review

Environmental enhancements or behavioral modifications have been the focus of preventative measures to defend against water accidents (A. E. Peden & Franklin, Citation2020; Morrongiello et al., 2013; R. C. Franklin & Peden, Citation2017). The creation of shallow water areas for kids, the installation of fences, and the posting of warning signs about potential danger zones are examples of environmental improvements. Education regarding drowning prevention and first-aid procedures in the event of an accident is part of the behavioral adjustments (Wang et al., Citation2020). Although environmental improvements are significant and have had some effectiveness, they are not infallible safeguards against careless or imprudent behavior that could result in accidents. Therefore, behavioral modifications might be more successful in reducing unintentional water mishaps.

As many accidents happen when responsible adults are absent (Kemp & Sibert, Citation1992) or do not provide close supervision during children's water activities (Blum & Shield, 2000; Moran, 2009), previous studies have emphasized the significance of parental supervision. Thus, raising parents' awareness of the dangers of drowning and the necessity of keeping an eye on them near water should enhance parental supervision (Morrongiello et al., 2013; Wang et al., 2020). Parent-focused swimming programs could help improve parental supervisory behavior because parents don't always realize how important it is to watch over their children when they're near water (Moran, 2009; Morrongiello et al., 2013).

Method

The researchers employed a quantitative approach using a questionnaire to collect information on water safety education among school children as a case study in Gombak, Selangor. The instrument was adopted from A total of 681 school children from secondary school aged between 13 and 19 years old were invited to participate in this study, 532 completed the survey with a 78.1 % response rate. A total of 29 respondents were missing values. The background of participants is presented in Table I. Majority of the respondent were Malays (80.2%), followed by Indian (10.3%), Chinese (8.1%), and Others (1.4%). Respondents were selected based on purposive sampling. The respondents of this study were students aged between 13 to 19 years old. The sample of the study was 681 respondents. This study was a cross-sectional study. Permission to conduct the study was obtained from the designated school principal. The instrument is adopted from Farizan, Sutan, &Mani (2019) and Farizan (2019). In terms of data analysis, data was collected from a survey to analyze the demographic information, and attitude on water safety and drowning risk. Basic descriptive statistics were presented in terms of frequency (f), percentage (%), mean (M), and standard deviation (SD).

Result and Discussion

The researchers employed a quantitative approach using a questionnaire to collect information on water safety education among school children as a case study in Gombak, Selangor. The instrument was adopted from A total of 681 school children from secondary school aged between 13 and 19 years old were invited to participate in this study, 532 completed the survey with a 78.1 % response rate. A total of 29 respondents were missing values. The background of participants is presented in Table I. Majority of the respondent were Malays (80.2%), followed by Indian (10.3%), Chinese (8.1%), and Others (1.4%). Respondents were selected based on purposive sampling. The respondents of this study were students aged between 13 to 19 years old. The sample of the study was 681 respondents. This study was a cross-sectional study. Permission to conduct the study was obtained from the designated school principal. The instrument is adopted from Farizan, Sutan, &Mani (2019) and Farizan (2019).

In terms of data analysis, data was collected from a survey to analyze the demographic information, and attitude on water safety and drowning risk. Basic descriptive statistics were presented in terms of frequency (f), percentage (%), mean (M), and standard deviation (SD). Table 1 exhibits that most respondents which is 24.7% in this school consists of students who are 17 years old who are in Form 5,

followed by students who are 16 years old (Form 4) which is 20.3%, followed by students who are 19 years old (Upper 6), and 15 years old (Form 3).

Table 1. Age of Respondents

Age	Frequency	Percentage
13 years	35	7.0
14 years	43	8.6
15 years	93	18.5
16 years	102	20.3
17 years	124	24.7
18 years	9	1.8
19 years	96	19.1

Table 2 indicates the sex breakdown where a total of 336 students (66.8%) are female & a total of 167 students is male (33.2%).

Table 2. Sex of Respondent

Sex	Frequency	Percentage
Male	167	33.2
Female	336	66.8
Total	**505**	**100**

Research Question:

RQ 1: What is the level of students' attitudes toward water safety?

Table 4 portrayed students' attitude towards water safety and drowning risk as follows. Two aspects of water safety exhibited a very low level whereby the students responded that it is safe for them to swim without learning and without people around were very low.

Table 3. Attitude towards Water Safety and Risk of Drowning

	Mean	Standard deviation	Interpretation
Swimming alone	2.50	1.315	Low
Adult Supervision	3.81	1.203	High

Swimming with friends without adult	2.93	1.364	Moderate
Swimming with buoy	3.29	1.292	Moderate
Water safety message	4.25	1.066	Very high
Rules & signage obey	4.51	0.940	Very high
Rules & prohibitions spoil children's fun	3.32	1.313	Moderate
Set rules for safer play	4.29	1.044	Very High
Wear Lifejacket	2.60	1.293	Low
Check depth marking	2.80	1.549	Moderate
Safe to swim without learn swimming	1.95	1.151	Very Low
Safe to swim without people around	1.71	1.097	Very Low
Swim with ordinary attire	2.49	1.233	Low
Identify Rip current	3.98	1.070	High
Parents have water safety knowledge	4.37	0.985	Very High
Parents learn swimming	4.00	1.067	High
Schools teach water safety	4.18	1.050	High
Parents know CPR	4.24	1.006	Very High

Parents Learn CPR	4.16	1.055	High

RQ 2: What is the relationship between sex and students' attitude toward water safety?

Table 5 shows that there is no correlation between the gender factor and students' attitudes toward water safety. A chi-square test for independence indicated that no significant association between sex and students' attitude towards water safety, χ^2 (4, n = 502 = .121, p = .120, phi = .121).

Table 4. Chi-square Tests (Sex & Attitude towards water safety)

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.320[a]	4	.120
Likelihood Ratio	7.131	4	.129
N of Valid Cases	502		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 4.66.

Table 5. Symmetric Measures (Sex & attitude towards water safety)

		Value	Approximate Significance
Nominal by Nominal	Phi	.121	.120
	Cramer's V	.121	.120
	Contingency Coefficient	.120	.120
N of Valid Cases		502	

RQ 3: What is the relationship between age and students' attitude towards water safety?

A chi-square test for independence indicated that there is a significant association between age and students' attitude towards water safety, χ^2 (24, n = 502 = .027, p = .027, phi = .027)

Table 6. Chi-Square Tests (Age & & attitude towards water safety)

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	38.980[a]	24	.027
Likelihood Ratio	38.916	24	.028
N of Valid Cases	502		

a. 18 cells (51.4%) have an expected count of less than 5. The minimum expected count is .25.

Table 7. Symmetric Measures Age & & attitude towards water safety

		Value	Approximate Significance
Nominal by Nominal	Phi	.279	.027
	Cramer's V	.139	.027
	Contingency Coefficient	.268	.027
N of Valid Cases		502	

This indicates that the students of this school pay less attention to their own safety when carrying out water activities. Without knowledge of water safety, they are at risk of drowning. They probably tend to practice dangerous behavior such as diving into the lake headfirst when entering a watery area without realizing that the area they are playing in may have dead trees that could injure their head. They can also potentially get injured. In addition, water recreation activities carried out have various physical hazards and biological hazards depending on the location of the activity. Slippery floors, unfenced swimming pools, sharp structures in lakes and unstable boats are examples that often invite injury and can lead to death or risk of drowning.

Respondents were also found to prefer swimming alone. This turns out to be dangerous for them because if something undesirable happens such as a sudden strong current (head water), they are likely to be easily swept away or injured such as being caught by a jellyfish or stepped on by a sea urchin. No one could help them at that point. The findings of the study also portray that they agree with safety aspects such as receiving water safety messages, compliance with laws and safety flag signs, and the determination of safe areas for swimming. But they are still less concerned about the importance of laws and prohibitions as things that can take away their sense of fun while being in the water when these two aspects will help to save themselves.

Similarly, they gave feedback that it is important for parents to know CPR and learn CPR because if something unexpected happens, parents are the first to save their child before emergency help arrives. Respondents were also found to prefer swimming alone. Research findings showed that the drowning risk is high since the respondents preferred to swim alone while doing water activities. This is supported by studies in Thailand where informal development of swimming skills by rural children who were taught by peers or self-learned contributed to a high number of drownings among children. They felt that it was safe to swim even though they did not learn to swim. If this continues to occur, the degree of drowning will be higher. Furthermore, this turns out to be dangerous for them because if something undesirable happens such as a sudden strong current (headwater), they are likely to be easily swept away or injured such as being caught by a jellyfish or stepped on by a sea urchin. No one could help them at that point.

While doing water activities, they wear ordinary attire compared to wearing swimming suits. Even though it is advisable to wear proper swimming costume since it facilitates them to swim. In addition to age, drowning rates have been shown to vary by gender and race (Erinn, 2010). Statistics show that drowning fatalities occur much more often in boys than in girls (CDC, 2008; Saluja Brenner, Trumble, Smith, Schroeder, T., & Cox, C. (2006). After one year of age, males are at greater risk than are females, with peaks in both the toddler and adolescent age groups (Brenner, 2003). Previous studies proved that more males drown than females (Turgut and Turgut 2014; Sheikhazadi and Ghadyani 2009; Kiakalayeh et al.; 2008; ILS 2007; Lunetta et al. 2004; Quan and Cummings 2003). It can be a result of unsafe behaviors and attitudes of males as stated by Brenner et al. (2001), Howland et al. (1996), Moran (2006), Murray and Lopez (1997), Peden et al. (2002), and Quan and Cummings (2003), but also a result of that females prefer safer water environments than males (Moran, 2006). Males are reported to experience drowning three times more frequently than females in all age groups. Turgut, Yaman, & Turgut (2016) posited that such a water safety

education program can help increase the knowledge and safe lifesaving skills of children.

Conclusion

In sum, propagating the message on water wise and increasing the level of perceptions on the risk might be crucial in influencing the attitude of school children towards developing safe behavior. As a result, the burden of child death and morbidity from drowning will be lessened. It was also hoped that this study would be helpful in providing information and identifying the need for establishing an intervention to improve drowning preventive intervention in this country. The initiatives on water wise as the drowning prevention strategy may emphasize the significance of schools to play their roles in protecting the children's water safety. In addition, increased swimming ability and water safety skills are considered important drowning prevention methods as posited by various studies (American Academy of Pediatrics [AAP], 2000; Brenner & AAP, 2003; International Life Saving Federation Education Committee, 2007; World Health Organization [WHO], 2010).

Nonetheless, evidence suggests that approximately 65% of children aged between 4-11 and 45% of children or adolescents with aged between 12-17 cannot swim at all or in deep water as supported by Irwin, Irwin, Ryan, & Drayer (2009). Hence, parental supervision is vital to decrease the drowning risk. A good governance is crucially vital to be practiced by consolidating the collective effort between ministries which involve Ministry of Health, Ministry of Education, Fire and Rescue Department, Coastguard, Disaster reduction, as well as Ministry of Tourism. The need to align the collective strategies with Sustainable Development Goals (SDGs). Furthermore, a massive and comprehensive strategies need to adhere water wise education among children. For instance, putting physical barrier, training of basic swimming skills, public awareness on drowning, managing flood risks, disaster warning system in high-risk area, rescues and resuscitation, lifeguard, risky area marking, media influence. This still has a few limitations in interpreting the findings, regarding the study's methodology. First, it is important to recognize that the respondents in this study represent a very narrow segment of the general population in scope which covers only Gombak area, and the sampling is purposive sampling. Hence, the generalizability of the study is limited.

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