CPR-Drowning Education for School Children Living in the Coastal Community Towards Improving Their Well-Being: A Scoping Review

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Abstract

Drowning is a one of the most common cause of injury death among young children worldwide. Providing CPR education for primary school children can increase the lay bystander resuscitation rate and survival rate. This scoping review aimed to summarize the available evidence about CPR-drowning educational needs for primary school children especially living in the coastal community area. We identified 13 relevant studies based on inclusion criteria using EBSCO, ProQuest, Scopus, ScienceDirect, PubMed and Google Scholar databases. We searched for English-language studies published from year 2007 to 2020 by following the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews. Data were extracted and thematic analysis conducted to synthesize results from the identified studies. The thematic analysis revealed three domains for the CPR-drowning education specifically for school children living in the coastal community: 1) current issues on drowning among primary school children, 2) society perception towards drowning and CPR, and 3) exposure of CPR education towards primary school children well-being. Those domains will be the main elements for developing the CPR-drowning education program for primary school children. Thus, introducing CPR-drowning education for primary school children specifically who are living at the coastal community area will improve their well-being.

Keywords: *Drowning, Primary school children, Costal community area, Cardiopulmonary resuscitation.*

Introduction

Drowning is a leading cause of injury death and it's ranked within the top 5th mortality cases among children under 14 years old [1]. Based on the year 2016 statistics, it was shown that 320, 000 drowning cases annually have been recorded worldwide [1]. Furthermore, 7% of the death related to injury was caused by drowning and it also became the 3rd prime killer of unintended injury death globally. In Asia, the death due to drowning was high among children at 1 to 4 years old in Bangladesh, Cambodia, Vietnam, Thailand, Beijing and Jiangxi [2]. However, Thailand has been recorded by the WHO as the country with the highest drowning deaths among ASEAN countries [3]. In Malaysia, every year almost 500 victims drowned, and the drowning cases have been ranked at the 2nd place for the cause of mortality among children age 1 to 18 years old [4].

A recent study has shown that the victim who drowned within 4 to 6 minutes without any resuscitation action has been performed, the victim can be suffered from hypoxia and brain death with subsequently lead to death [5]. Besides, the drowning process was taking place by stages which can take 10-12 minutes for the victim to die. This condition will be worsened for the children since the time taken for death may occur earlier due to their fragile body. Furthermore, the potential death for drowning might reduce if several measures to overcome this issue [1]. American Academy of Pediatric has described about the water competency, swim lesson and skills for prevention of drowning among children [6]. The water competency includes water-safety awareness, basic swim skills and the ability to recognize and response to a swimmer in trouble [7].

Furthermore, the water competency includes knowledge and awareness on ability to recognize and respond to a swimmer in distress, call for help, and perform safe rescue and cardiopulmonary resuscitation (CPR) [7]. The CPR is the cornerstone of the treatment of cardiac arrest and improving victim's chances of eventual survival [8]. Performing CPR to the victims required adequate knowledge and technique to increase the potential for the victims to survive [9]. Moreover, the International Liaison Committee on Resuscitation (ILCOR) and the World Federation of Societies of Anesthesiologists (WFSA) have encouraged the school children to train with CPR skills so that it will increase in the number of cardiac arrest survivors worldwide, but also the social benefits of enthusiastic and positive young people [10].

Higher levels of fatality and morbidity due to drowning have caused greater social concern for young children specifically for primary school children in Malaysia especially those who are living at the coastal community area. Furthermore, children who lives in coastal community are very risk for drowning due to the nature of their playground located at coastal area. Empowering and educating them about CPR-drowning is a vital element for them towards their well-being. Moreover, there is a limited evidence on educating CPR to primary school children in Malaysia.

Besides, the United Nations adopted the 17 Sustainable Development Goals (SDGs) in the year 2015 as the new development agenda until 2030 [11]. The 3rd SDGs is about “good health and well-being” for all ages. Hence, educating CPR-drowning to primary school children will therefore lead to a marked improvement in their well-being as well as improve their quality of life. Thus, this scoping review aimed to summarize the available evidence on CPR-drowning educational needs for primary school children especially living in the coastal community area. The authors also hoping to fulfil the achievement of the part of the objectives of the SDGs by doing this study.

Methods

We followed the PRISMA statement extension for scoping reviews to conduct this study [12]. Although this review followed the general guidelines for systematic reviews, the grey literature was not searched, quality appraisal of the included papers was not performed, and foreign-language papers were not translated. We began by identifying our primary goal as describing the available evidence regarding CPR-drowning educational needs for primary school children who are living in the coastal community area. Our secondary objective was to propose the CPR-drowning education program for them towards improving their well-being.

Search strategy

The research databases that have been used were EBSCO, ProQuest, Scopus, ScienceDirect, PubMed and Google Scholar. Next, some inclusion criteria have been applied as the search strategies which as the articles must be an academic journal and published from 2007 until 2020 only. Due to the limited paper, we included papers from the last 13 years.
The articles also must be in full text and were peer-reviewed. There were several keywords used when searching for articles which are 'Cardiopulmonary Resuscitation', 'drowning', AND 'primary schoolchildren', 'coastal community area'. Some combination of keywords with Boolean Search strategy was also implemented during articles' searching such as 'AND' and 'OR'. These words were used for certain keywords only for instance, 'primary school children OR elementary school children', 'cardiopulmonary resuscitation AND drowning', 'cardiopulmonary resuscitation AND primary school children OR elementary school children'.

Data synthesis and analysis

For the purpose of understanding key concepts and sources of evidence in this literature, thematic analysis was conducted following article review in the course of meetings by the authors, and a data chart developed for extracting findings and key contextual indicators. Each article was reviewed for data extraction by two members from the authors, with discrepancies resolved through discussion and consensus in meetings with a third reviewer and ultimately, with the full authorship team. The authorship team then independently and collaboratively reviewed summative findings of the data extract, resulting in: Current issues on drowning among primary school children, society perception towards drowning and CPR, and exposure of CPR education towards primary school children well-being.

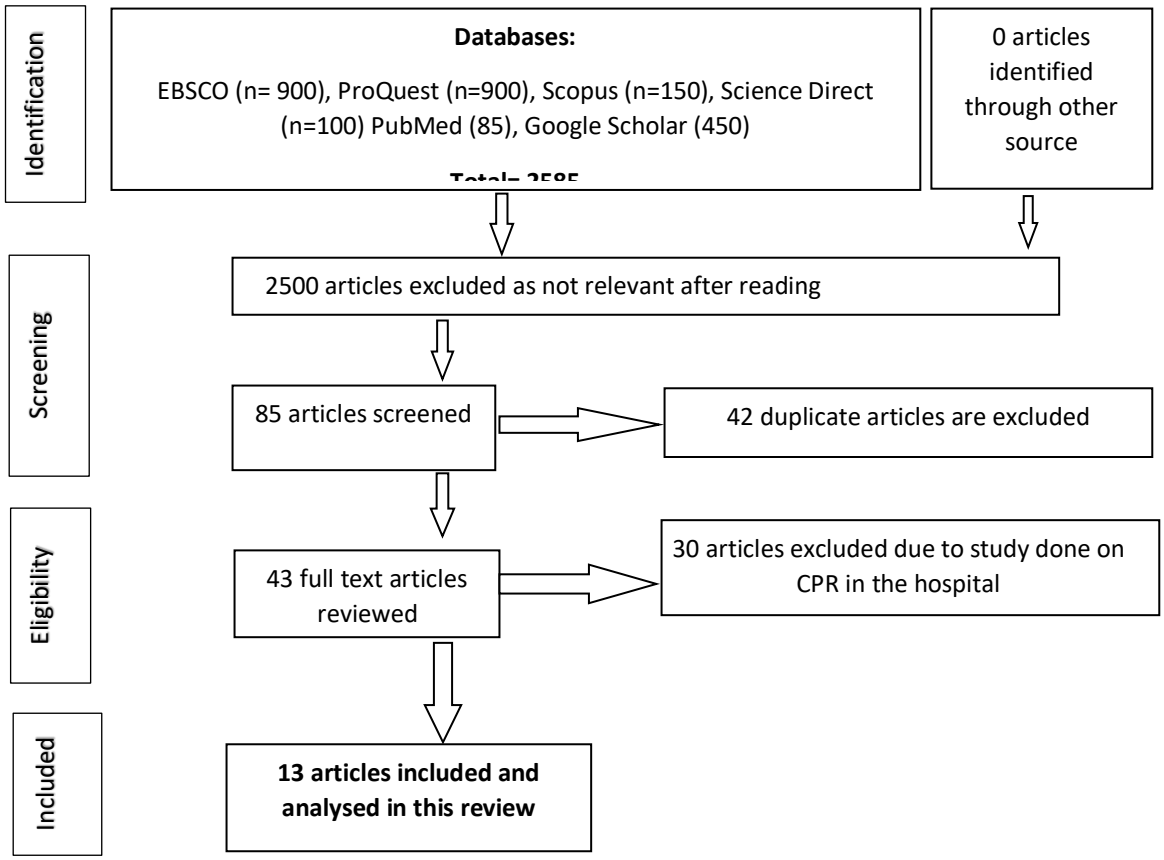

Figure 1. Literature search flow

Results

The initial search from literatures identified 2585 articles from EBSCO, ProQuest, Scopus, ScienceDirect, PubMed and Google Scholar sources. We evaluated the 85 articles in full text following screening of titles and abstracts and removing duplicates. Among these, we selected and included 13 articles in this scoping review. The details on the inclusion and exclusion process are provided in the PRISMA flow diagram figure 1. Out of the included 13 articles, 9 studies were using survey, 3 studies used intervention design and 1 study used case control study design. Among them, only study from Malaysia and the rest from other countries. The characteristic of included studies can be referred to the table 1. The details findings from the 13 articles will be explained further in the following session based on the thematic analysis and data extraction.

Current issues on drowning among primary school children

A recent study has shown that 1013 from 8390 participants which accounted 13% of total studied participants have experienced on non-fatal drowning in children aged 8-18 years old that have carried out in Guangdong, China [13]. Another study also found that drowning deaths

accounted for 7.2%, 12.5% and 5.8% of all deaths in 1–4, 5–9 and 10–14 years age groups, respectively among young children [14]. They further described that the adjusted incidence of drowning deaths was 14.3 per 100 000 children, with it being higher in urban (16.1 %) areas. Nearly half of the children drowned in a river (5.9, 95% CI 5.6 to 6.1) followed by in a pond (2.8, 95% CI 2.6 to 2.9) and drowning death incidence was the highest while playing (5.1, 95% CI 4.9 to 5.4) and bathing (4.0, 95% CI 3.8 to 4.2) with the former accounting for more deaths in 1–4 years age group [14].

A study done in Austria found that a statistically significant difference between drowning incidence during school holidays and school days, with relative risk (RR) of drowning on a holiday 2.40 times higher than on a school day [15]. The risk was similar for males and females but differs between children 5–9 years and adolescents 10–17 years of age in their study. They further described that drowning rates among 5–17-year-olds are more than twice as high during holidays than on school days [15].

Another study carried out in India found that 342 children (4.06%) out of 8433 children had a history of drowning [16]. The incidence of drowning was 5.21% among males and 2.23% among females' children. Thus, the prevalence of drowning is found to be 4060 incidences of drowning/1,00,000 population in this age group, that is, 270 incidences/100,000 population/year. Furthermore, drowning rates were highest in the age group of 10–12 years (40.6%) followed by 5–9 years (32.2%). Maximum incidences of drowning were in ponds (37.7%), followed by rivers (24.3%) and swimming pools (17.3%) [16]. In Malaysia, the highest number of deaths caused by drowning majorly occurred among school children age 10 to 14 years old [17]. They also mentioned that around 500 children drown annually with an average of 286 mortality cases recorded in Malaysia.

Society perception towards drowning and CPR

Nowadays, childhood drowning is a global public health concern. A study done in a rural area of China found that majority of the cases (n=85; 64%) simply lost their footing and fell into the water, and a further 29% (n=38) drowned while swimming [18]. They further described that nearly two-thirds (n=82) of the incidents occurred within 500 meters of the home or school. Most cases (n=109; 82%) died at the scene, and a further 7% (n=9) died on the way to hospitals or healthcare facilities. The incidents occurred mainly in the summer months (July–September; n=61; 46%) and warmer months (April–June; n=44; 33%), and during daytime (11:00 to 15:00 h; n=86; 65%). Nearly 75% (n=99) of the incidents occurred in ponds (34%), rivers (26%) or lakes (14%). No cases occurred in a swimming pool and none of the children's caregivers knew how to perform CPR for their drown child [18].

Another study done in Thailand described that less than one-fifth (18%) of children in the household could swim and about one-quarter (23%) of guardians did not perceive drowning as leading cause of death among children [19]. Furthermore, 25.4% of their studied participants perceived that their child is not at risk of drowning and 40% unable to determine that drownings is a serious problem [19]. This study was conducted among 633 guardians of primary school children who had at least one child 6-12 years old at the rural community area of Thailand.

A study done in Auckland about perceived swimming competency and risk of drowning in an open water environment among parents or caregivers of primary school children [20]. Their findings showed that 87% of parents reported that their children could swim, with more than one-half (52%) believing that their child's swimming competency was good/very good, yet most (74%) considered their child could swim only 25 m or less. Most parents (59%) and almost all children (81%) had never actually swum their reported distance in open water. Despite these low levels of competency, one-half (51%) of parents thought their children were safe/very safe in open water.

Another study done in Austria among primary school children aged 11-12-year-old for assessing their beach safety knowledge and awareness [21]. The participants were given one day first aid, CPR and beach safety training which was designed by their curriculum specialists. Their findings showed statistically significant improvements in recognition of the red 'beach closed' flag, aquatic safety signs, how to identify a rip current and choosing the safest place to swim at a beach that included a rip current in the picture. Furthermore, their studied participants were more willing to provide first aid assistance to family members and friends in an emergency situation following their training [21].

Exposure of CPR education towards primary school children well-being

A recent study done at Spain to assess the knowledge and attitude of first aid (FA) and basic life support of schoolteachers and parents children of pre-school and elementary school (Abelairas-Gómez et al., 2020). Their finding showed that 57% of studied participants stated to have knowledge of FA. However, only 4 participants out of 268 were able to put in the correct order the steps of the basic life support sequence, and nobody answered correctly all the questions about CPR [22]. Therefore, exposure of CPR education is important for the schoolteachers as well as parents towards their children well-being and at the same time to transfer knowledge to the children.

Another mixed method study carried out to investigate the effects of implemented CPR training on the knowledge of schoolchildren in the Slovenian elementary schools and their willingness, attitudes, and intentions toward helping others and performing CPR [23]. Their finding showed that significant progress in knowledge was noted in most CPR-related procedures one or two months after the training. The greatest progress was in placing AED electrodes in the right positions, and in the chest compression rate and depth (all p = 0.001). Furthermore, two themes were coming out from the analysis of the focus groups: (a) the effects of cardiopulmonary resuscitation training on schoolchildren, and (b) the systemic responsibility of the school system and professional bodies [23].

A study done in Germany found that the CPR training program increased the school children' knowledge and practical skills [24]. They further described that the school children achieved better results for knowledge (92.86% ± 8.38 vs. 90.10% ± 8.63, P = 0.04) and ventilation rate (4.84/min ± 4.05 vs. 3.76/min ± 2.37, P = 0.04) when they trained by their teachers than when they were trained by emergency physicians. Their study aimed was to compare schoolteachers and emergency physicians as resuscitation trainers for schoolchildren [24].

A study has recommended teaching CPR skills in primary school children as early as 12 years old or earlier [25]. This statement showed that the potential of primary school children should not be underestimated in saving the lives of the community. Moreover, the school children also can act as a "multiplier" in disseminating the knowledge of CPR towards the community especially their family members [25]. In their study, 160 participants were divided in teams of 3 and observed for successful delivery of chest compressions on the little Anne Adult CPR training manikin. Their study proof that the primary school children are capable of learning and performing effective hands only bystander CPR and should be taught in schools even as young as the primary level.

Discussion

Drowning has been one of the major causes of unintentional death among primary school children. Statistic of drowning from the World Health Organization (2020) shown that the occurrence of drowning was mostly among male children age 5 to 14 years old [1]. Besides, early resuscitation by bystanders was one of the most successful measures to save a life. Since death cases due to drowning highly affected children, implementing CPR-drowning educational program among school children may bring positive impacts to the community.

Current issues on drowning among primary school children

A study in India mentioned that the river was the place that records the highest occurrence of drowning and followed by the pond [14]. This finding was similar to the study in Australia that river records most of the drowning cases followed by creeks and streams [15]. Whereas a study from India gave finding that pond has the highest drowning rate, and the river came after [16]. These findings exposed that river and pond were two places with high potential for school children to drown. Unpredictably, children with good swimming skills appear to have a higher drowning risk compared to children with poor swimming skills [13&16].

Moreover, the victims of drowning were majority recorded among male children [1, 13, 16 & 17]. The finding from 10 years study in Australia by Royal Life Saving National Fatal Drowning Database shown that children age 5 to 9 years old drowning rate was higher compared to another age group during school holiday while children age 10 to 17 years old experienced high drowning rate during the study period [15]. A study described different findings with children in the age group of 10 to 12 years old who gave a higher number of drowning and followed by children in the age group of 5 to 9 years old [16].

The above data have shown that drowning can be happened to the primary school children easily. The incidence of drowning was mainly happened to male children. Besides, children who live in the coastal community are a very risk for drowning due to the natures of their playground located in the coastal area. The children may also use this opportunity to spend time with their school friends at these locations without having adequate swimming skills, appropriate information regarding safety and life-saving skills or supervision by their guardians. This situation indirectly creates the possibility for them to drown while they were having fun among themselves. Therefore, this alarming issue warrants immediate attention and intervention needs in Malaysia [26].

Society perception towards drowning and CPR

A study has shown that drowning occurred mostly in ponds, lakes and rivers, but not in the swimming pools [18]. The issue was similar to other research findings on childhood drowning, boys and younger children are over-represented in coastal areas in developing countries [14,16 &19]. Therefore, prevention strategies should include educational programs focusing on supervision and the use of flotation devices by children. Furthermore, the coastal community area is relatively with fewer hospitals, so prehospital care and community training programs could be more important.

A study results from Thailand revealed that two-third of guardians and four-fifth of their children cannot swim [19]. Moreover, their study reported that drowning risk perception among rural guardians and indicates that guardians did not perceive drowning as a leading cause of death among children [19]. In fact, drowning is a leading cause of injury death among children aged less than 15 years worldwide [1]. Drowning is one of the most common causes of death among young children in developing countries in Asia.

Besides, the water competence has long been regarded as a critical safety factor in the prevention of drowning among school children [20]. Although their study showed that parent's perspective towards water competence of their children was very high. From a drowning prevention perspective, most of the parents and almost all children in their study had never actually swum their reported distance in open water environments where most drownings occur [20].

The results highlight the need to promote drowning risk perceptions among the coastal community area and consider CPR-drowning education on this particular area. Therefore, it can develop the primary school children's awareness on the importance of saving a person's life who is at the emergency situation. Furthermore, reinforcement on the value of school-based training that provides a general foundation for aquatic safety, with the caveat that current programmes must be evaluated to ensure their content has a robust prevention focus [21].

Exposure of CPR education towards primary school children well-being

A recent study done to examine first aid (FA) and CPR information on the attitudes and opinions of teachers and parents about its incorporation in the curricula of schools [22]. It seems, however, that both teachers and parents were persuaded that training on this topic should not be limited to health care practitioners or other collectives with the obligation to act, and that it should also be a compulsory part of the curriculum in lower and higher education so that it will improve the well-being of the school children.

On the other hand, the schoolchildren's theoretical knowledge on CPR was higher after CPR training and that the level of knowledge was retained one to two months after training [23]. The results revealed positive effects of training schoolchildren in CPR, making it very important to include CPR training in school curricula early enough. It can be concluded that early CPR training for children is crucial and should be introduced as a mandatory part of school curricula in those countries where CPR is not yet mandatory.

The instructional visual aid and video were used as an educational tool for training CPR among school children in the 3 intervention studies included in this review [21, 23 & 25]. Furthermore, children in primary schools are centered, curious about knowledge and inspired to learn new skills. Additionally, newly obtained knowledge is likely to be shared with parents and peers. Therefore, CPR education for primary school children will result in beneficial for the community. Thus, an initiative to educate primary school children may increase the population that exposes to CPR skills. In addition, teaching the skills towards others can help themselves in enhancing their skills in real-life situations as well as improve their well-being.

Implications for health care practice

From these findings, primary school children are more exposed to drowning and some of them have experienced drowning in the past. Furthermore, the childhood drowning has charted in the top five factors of death among children age 1 to 14 years old in 48 countries from 85 countries around the world [1]. Besides, the sufficient evidence is now available for CPR education programs to be started in schools as early as possible. Providing CPR training courses in schools is potentially useful for the prevention of childhood drowning especially in the coastal community area.

Despite the good evidence available, CPR-drowning education for primary school children has still not yet been widely implemented in Malaysia. Although various countries are starting to develop evidence-based curriculums on CPR education in schools, there is currently limited evidence available in Malaysia. Thus, this issue is encouraging the authors to start on empowering and providing CPR-drowning education for school children who are living in the coastal community area of Malaysia. So that it will improve the children's well-being as well as improve the quality of life of people around them.

Conclusions

Sudden cardiac death due to drowning is one of the most frequent preventable causes of death. Providing CPR-drowning education to the primary school children may help in reducing the mortality rate caused by drowning. The knowledge from CPR-drowning educational program can be disseminated among the family members of the school children as this approach indirectly helps in building their awareness towards saving lives. The educators and healthcare providers play an important role in the prevention of drowning among children. Moreover, the spreading of knowledge will be able to expand the population equipped with CPR as life-saving skills and increase the number of potential bystander rescuers among the community. Thus, it will accelerate the achievement of the part of the objectives of the SDGs by improving the well-being of the children.

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Table 1: Characteristics of the Included Papers (*CPR-Drowning Education for School Children Living in the Coastal Community Towards Improving Their Well-Being: A Scoping Review*)

Authors/Year	Country	Research design	Objectives	Study population	Measures (Tools) used	Finding key points
Dandona et.al, (2019)	India	Survey: a population-based study	To identify the risk profile for drowning deaths in children in the Indian state of Bihar	A total of 224077 children aged 1–14 years resided in 109689 households	Each household were surveyed using the MS-Access software in hand-held tablets.	Sixty per cent of children were already dead when found. None of these deaths were reported to the civil registration system to obtain death certificate.
Xu et. Al, (2019)	China	An exploratory design	To establish an exploratory model for predicting drowning risk among children.	8390 children (8-18 years old)	Developed questionnaire	Females, older age and lower swimming skills were negatively associated with drowning. After employing the prediction model with these factors to estimate drowning risk of the students in the testing samples, the results of Hosmer-Lemeshow tests showed non-significant differences between the predictive results and actual risk ($\chi 2 = 5.97$, $P = 0.65$).
Peden et. Al, (2019)	Austria	Population survey	To examine difference in frequency and circumcense in drowning death	188 children (5-17 years old)	A total population survey (2005–2014) of unintentional fatal drownings was extracted from the (Australian) Royal Life Saving National Fatal Drowning Database.	A total of 188, 5–17 year-olds drowned during the study period.
Veetil et.al, (2017)	India	A cross-sectional, population-based study	To study the prevalence, risk factors, and types of drowning among school children in the Malabar region.	8433 school children of 5–15 years.	Population-based study by semi structured interview method was performed	A total of 342 (4.06%) students had a history of drowning. The prevalence of drowning was much higher compared to figures reported in literature.
Amar-Singh et.al, (2014)	Malaysia	Survey	To collate data on childhood drowning in Malaysia and review existing drowning prevention measures.	All reported child fatal and non-fatal drownings from 2000 to 2008 were included.	This study used secondary data from governmental and non-governmental agencies.	Most drowning took place in east coast regions during the annual monsoon season. It was 3.52 (2.80–4.41) times more common in boys and most prevalent among 10–14 years.
Stanley & Moran (2017)	Auckland	A cross sectional survey	To explore the relationship between perceived swimming competency and risk of drowning in an open water environment	309 parents or caregivers of primary aged children (5 – 11 years)	Developed questionnaire	Most parents (59%) and almost all children (81%) had never actually swum their reported distance in open water. In spite of these low levels of competency, one-half (51%) of parents thought their children were safe/very safe in open water.

Laosee, Khiewyoo, Somrongthong, (2014).	Thailand	A cross-sectional household survey	To describe drowning risk perceptions of guardians and to identify barriers to developing a child's swimming skills.	633 guardians of primary school children	Developed self-administered questionnaire.	More than one-quarter (25.4%) perceived that their child is not at risk of drowning; and 40% unable to determine that drownings is a serious problem. There were statistical differences of perceptions of barriers between guardians who had a child that could swim and could not (P<0.01).
Wilks, Kanasa, Pendergast, Clark, (2017).	Australia	Intervention study by providing a training programme with pre and post measurement	To assess beach safety knowledge and awareness among a group of primary school students	107 primary school children aged 11-12 year olds	The one day first aid, CPR and beach safety training was designed by curriculum specialists including 50 item quiz.	Following training students were more willing to provide first aid assistance to family members and friends in an emergency situation.
Yang, Nong, Li, Feng, Lo, (2007).	China	A case–control study	To examine risk factors associated with childhood drowning in rural areas of a developing country.	A total of 133 cases and 266 controls	A developed semi structured questionnaire	None of the children's caregivers knew how to perform cardiopulmonary resuscitation. For children aged 5–14 years, the main risk factors were that the child did not have the experience of playing near or in water regularly.
Abelairas-Gómez et.al, (2020)	Spain	Survey	To assess the knowledge and attitude of first aid (FA) and basic life support of school teachers (pre-school and elementary school) and parents children.	470 participants (177 teachers; 242 parents; 51 teachers that were also parents)	A reformatted and validated self-administered questionnaire	Only 4 participants were able to put in the correct order the steps of the basic life support sequence, and nobody answered correctly all the questions about cardiopulmonary resuscitation.
Pivač, Gradišek, Skela-Savič, (2020).	Slovenia	A mixed methods research design	To investigate the effects of implemented cardiopulmonary resuscitation training on the knowledge of schoolchildren	764 schoolchildren aged 12.5–14.5 years, 8 cardiopulmonary resuscitation instructors for FGD	CPR training. A Separate Pre-Post Samples Design was conducted to obtain quantitative data and a focus groups research method was employed to obtain qualitative data.	Significant progress in cardiopulmonary resuscitation knowledge was noted after training implementation, with the greatest progress seen in the youngest age group (mean age 12.5). Analysis of the focus groups yielded two themes: (a) the effects of cardiopulmonary resuscitation training on schoolchildren, and (b) the systemic responsibility of the school system and professional bodies
Lukas et. Al, (2016)	Germany	A six-year longitudinal study	To compare schoolteachers and emergency physicians as resuscitation trainers for schoolchildren. It also investigated whether pupils	A total of 261 pupils (fifth grade) at two German grammar schools	The studied participants received resuscitation training by trained teachers or by emergency physicians. The annual training events stopped after	The training events increased the pupils' knowledge and practical skills. When trained by teachers, the pupils achieved better results for knowledge and ventilation rate than when they were trained by emergency physicians.

			who were trained annually for 3 years retain their resuscitation skills after the end of this study		3 years in one group and continued for 6 years in a second group.	
Zeleke et.al, (2019)	California	Intervention study by using CPR instructional video	To assess if children (average age of 12) were able to perform high quality chest compressions and whether this can be achieved by supplementing CPR instructional video with other methods to time delivery of compressions.	160 students	A total of 160 participants were divided into 3 groups. The CPR instructional video was played for all 3 groups. One group (n = 53) was instructed to time their compressions with a popular music. Another group (n = 56) was assigned to a specially designed video game whereby they practiced how to time chest compressions. The control group (n = 51) consisted of those who only watched the video.	This study demonstrated sixth graders are capable of learning and performing effective hands only bystander CPR and this can and should be taught in schools even as young as the sixth grade level.