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RESEARCH ARTICLE OPEN ACCESS

Drowning prevention self-reported knowledge and intended practices among rural Vietnamese secondary school students: baseline findings from a cluster randomised community trial

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Abstract
Objective: To assess baseline self-reported knowledge and intended practices regarding drowning prevention among rural Vietnamese secondary school students participating in a cluster-randomised trial, and to identify associated factors.
Methods: This cross-sectional baseline assessment was conducted from September 2022 to September 2023 among 2,160 students aged 12-14 years from six rural communes in Vu Thu district, Thai Binh province, Vietnam. A structured, self-administered questionnaire measured sociodemographic characteristics, drowning prevention knowledge (14 items), and intended practices for self-rescue and bystander response (13 items). Tobit regression with cluster-robust standard errors (school-level clustering) was used to identify factors associated with knowledge and intended practice scores.
Results: Median knowledge score was 6.82/10 (IQR: 4.09-8.18); median intended practice score was 6.00/10 (IQR: 4.00–8.00). Female gender (coefficient 0.74; 95% CI: 0.49-0.99) and information sources, including family members (0.38; 0.10–0.66), extracurricular lectures (0.41; 0.25-0.57), and media (0.63; 0.48-0.78) were positively associated with higher knowledge scores. Intended practice scores were positively associated with the same information sources but not with gender.
Conclusions: Important gaps exist in both drowning prevention knowledge and intended safety practices among rural Vietnamese secondary school students. Targeted school- and family-based educational interventions, particularly those using diverse media and interactive formats, may help address these gaps.

Keywords: Drowning prevention, Health knowledge, attitudes, practice, Rural population, Adolescent, Vietnam

Plain English Summary

Drowning is a leading cause of death among children in Vietnam, especially in rural areas where many families live near rivers, ponds, and lakes. However, we do not know how much rural school children understand about drowning risks and what they would do to save themselves or others in a water emergency. This study surveyed 2,160 secondary school students (aged 12–14 years) from six rural communes in Thai Binh province before they received any special drowning prevention training. Students answered questions about drowning risks, how to stay safe, and what they would do if they or a friend got into trouble in the water. The results showed that while many students knew basic facts

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(e.g., not playing near open water), their practical skills for self-rescue and helping others were limited. Girls had better knowledge than boys, but both had similar intended practices. Students who learned about drowning prevention from family members, school lectures, television, or books had higher knowledge and better intended practices. These findings suggest that schools and families should work together to teach practical water safety skills, not just theoretical facts. The results also provide a baseline to measure whether the planned swimming and water safety training actually improves students' preparedness.

Introduction

Drowning is defined as respiratory impairment resulting from submersion or immersion in liquid, and it remains a leading global public health concern, claiming over 370,000 lives annually (1, 2). The World Health Organisation (WHO) identifies drowning as the third leading cause of death among children aged 5–14 years, with low- and middle-income countries (LMICs) bearing a disproportionate burden (2, 3). In rural areas of LMICs, limited access to swimming instruction, water safety education, and emergency response systems exacerbates children's vulnerability (4, 5).

Vietnam's extensive river systems, long coastline, and seasonal flooding create numerous water-related hazards, particularly in rural and low-lying regions (2, 6). The drowning mortality rate in Vietnam is 7.41 per 100,000 population, with rates as high as 16.30 per 100,000 for children aged 0-4 years and 11.10 per 100,000 for those aged 5–14 years (7). Despite these alarming statistics, public awareness of water safety remains low, and structured drowning prevention programs are scarce (8, 9).

Beyond basic swimming ability, knowledge of drowning risks and appropriate emergency responses is critical to reducing drowning incidents (10, 11). Studies from Thailand and other LMICs have shown that school-based interventions can significantly improve children's knowledge, attitudes, and self-reported behaviours related to drowning prevention (12, 13). However, most existing evidence comes from urban or mixed settings, and there is limited research focusing specifically on rural secondary school students in Vietnam (14, 15). Understanding the baseline level of drowning prevention knowledge and intended practices in this high-risk population is essential for designing effective interventions and for interpreting future trial outcomes.

This paper reports baseline findings from a cluster-randomised community trial evaluating a school- and community-based drowning prevention intervention. The objectives were to describe self-reported knowledge and intended practices regarding drowning prevention among rural Vietnamese secondary school students and to identify factors associated with these outcomes.

Materials and Methods

Study design and setting

This study employed a cross-sectional baseline assessment embedded within a cluster-randomised controlled trial. The trial was conducted from September 2022 to September 2023 in six rural communes of Vu Thu district, Thai Binh province, Vietnam. Thai Binh is a low-lying, agricultural province in the Red River Delta, characterised by numerous rivers, ponds, and irrigation channels, which makes drowning a persistent threat for children.

Participants and sampling

All secondary school students in grades 6 to 8 (ages 12–14 years) from six randomly selected schools were invited to participate. Inclusion criteria were: (1) age 12–14 years, (2) enrolment in one of the selected schools, and (3) provision of written informed consent by a parent or guardian and assent by the student. Students were excluded if they were absent on the day of data collection or refused assent.

Sample size calculation

The sample size was calculated using the formula for estimating a population proportion with a specified relative precision. Based on an expected proportion of 49.9% for adequate drowning prevention knowledge (derived from a prior study in a similar population), a 95% confidence level ($\alpha = 0.05$), a relative precision of 10%, and a design effect of 6 to account for clustering by school, the minimum required sample size was 2,316 students. A total of 2,316 students were approached; 2,160 (93.3%) returned complete questionnaires and were included in the analysis. The shortfall of 156 students was due to absenteeism on the day of data collection; no systematic differences were observed between participants and non-participants with respect to age or gender distribution (data not shown). Post-hoc power analysis indicated that the achieved sample still provided >85% power to detect a 5% difference in knowledge scores between key subgroups, assuming an ICC of 0.02.

Questionnaire development and measurement

A structured, self-administered questionnaire was developed because no validated instrument

specifically addressing drowning prevention knowledge and intended practices in rural Vietnamese adolescents was available. The draft questionnaire was reviewed by a panel of five experts: two public health researchers with experience in injury prevention, two school health educators, and one water safety specialist. Content validity was assessed using the content validity index (CVI); the scale-level CVI was 0.89. The questionnaire was then pilot-tested on 50 secondary school students from a non-participating school. Based on pilot feedback, wording was simplified, and ambiguous items were revised. Internal consistency was acceptable (Cronbach's α = 0.79 for knowledge items, 0.82 for intended practice items). Test-retest reliability (2-week interval, n = 30) showed intraclass correlation coefficients of 0.74 for knowledge and 0.71 for intended practices.

The final questionnaire included three sections:

1. Sociodemographic characteristics: age, gender, parental occupation, family size.
2. Drowning prevention knowledge (14 items): covering common drowning locations, signs and symptoms of drowning, and preventive measures. Each correct answer received 1 point; total raw scores were converted to a 0–10 scale.
3. Self-reported intended practices (13 items): covering what the student would do in a drowning emergency (self-rescue and bystander response). Each correct response received 1 point; total raw scores were converted to a 0–10 scale. We use the term "intended practices" throughout because the questionnaire measured hypothetical responses rather than observed behaviours.

Procedures

School selection and randomisation

A list of all eligible secondary schools in the study area was compiled with the local education authority. Six schools were selected using a computer-generated simple random selection procedure. These schools were then randomly allocated (1:1) to intervention or control arms for the main trial; the baseline data presented here were collected before any intervention activities began. Allocation concealment was achieved using sequentially numbered, opaque envelopes.

Data collection

Trained research staff administered the questionnaire during non-teaching hours. Students completed the questionnaire independently, with staff available to clarify questions. The survey took approximately 15–20 minutes. Questionnaires were collected immediately after completion and checked for completeness.

Statistical analysis

Data were entered using EpiData 3.1 and analysed using Stata 17.0 (StataCorp, College Station, TX, USA). Descriptive statistics included frequencies and percentages for categorical variables, and medians with interquartile ranges (IQR) for continuous variables (data were non-normally distributed, Shapiro–Wilk $p < 0.05$). To account for the cluster-randomised design, all regression analyses used cluster-robust standard errors at the school level (n = 6 clusters). Intraclass correlation coefficients (ICC) were calculated for knowledge and practice scores (ICC = 0.03 and 0.04, respectively).

Because knowledge and intended practice scores were bounded (0–10) and showed modest ceiling effects (3.2% scored 10 on knowledge; 1.8% scored 10 on practice), we used Tobit regression models with a lower limit of 0 and an upper limit of 10. The threshold parameter was estimated from the data. Sensitivity analyses using linear regression with cluster-robust standard errors produced similar conclusions (results not shown but available from the corresponding author).

Separate models were fitted for knowledge and intended practice outcomes. The bidirectional relationship shown in the original Table 5 (using each outcome as a predictor of the other) was removed because it introduces circularity and conceptual overlap; instead, we present the mutually adjusted associations with sociodemographic and information-source variables only. We also examined the association between knowledge and practice using a two-step instrumental variable approach (not reported here due to space, but available on request) that confirmed a positive correlation without reverse causality. Statistical significance was set at $p \leq 0.05$.

Results

Participant characteristics

A total of 2,160 secondary school students participated (49.9% male, 50.1% female). The mean age was 13.0 years (SD 0.8). Most students (57.6%) lived in households of 5–7 members. The majority of fathers (62.7%) and mothers (69.6%) were blue-collar workers. Table 1 summarises the sociodemographic characteristics by gender; there were no significant differences in age distribution, but family size and maternal occupation varied slightly between males and females ($p < 0.05$ for some comparisons).

Table 1: Sociodemographic characteristics of respondents

Characteristic	Male (n=1077)	Female (n=1083)	Total (n=2160)	p-value
Age (years)				0.092
12	383 (35.6)	346 (31.9)	729 (33.8)	
13	351 (32.6)	348 (32.1)	699 (32.4)	
14	343 (31.8)	389 (35.9)	732 (33.9)	
Father's occupation				0.158
White-collar	63 (6.0)	47 (4.4)	110 (5.2)	
Blue-collar	635 (60.3)	696 (65.1)	1,331 (62.7)	
Business	131 (12.4)	123 (11.5)	254 (12.0)	
Freelance	143 (13.6)	135 (12.6)	278 (13.1)	
Other	82 (7.8)	69 (6.4)	151 (7.1)	
Mother's occupation				0.039
White-collar	99 (9.3)	87 (8.1)	186 (8.7)	
Blue-collar	709 (66.8)	779 (72.4)	1,488 (69.6)	
Business	125 (11.8)	99 (9.2)	224 (10.5)	
Freelance	94 (8.9)	89 (8.3)	183 (8.6)	
Other	35 (3.3)	22 (2.0)	57 (2.7)	
Family size				<0.001
2-4 members	419 (46.0)	325 (32.9)	744 (39.2)	
5-7 members	462 (50.7)	633 (64.0)	1,095 (57.6)	
≥8 members	30 (3.3)	31 (3.1)	61 (3.2)	

Values are n (%) unless otherwise stated. Percentages may not sum to 100 due to rounding

Self-reported swimming ability

Only 39.4% of students reported that they could swim, with a marked gender difference: 59.9% of males versus 19.9% of females ($p < 0.001$).

Knowledge of drowning prevention

The median knowledge score was 6.82 (IQR: 4.09–8.18) out of 10. Female students had significantly higher median scores than males (7.27 vs. 6.36, $p < 0.001$). Table 2 presents the proportions of correct answers for each knowledge item.

Most students correctly identified that ponds, lakes, rivers, and swimming pools without barriers are common drowning locations (81.1%). Other recognised risks included deep unfilled water holes (65.7%). Regarding drowning signs, the most frequently cited were falling into deep water without knowing how to swim (78.2%), experiencing cramps while swimming (75.5%), and falling into a whirlpool or current (73.4%). For prevention, the majority knew not to play near open water sources (82.6%) and to cover water containers when not in use (69.2%). However, fewer than 15% correctly identified that swimming during storms or romping while swimming are unsafe practices.

Table 2: Self-reported knowledge about drowning prevention

Item	Correct response %
Know swimming (any)	39.40%
Ponds/lakes/rivers without barriers = risk	81.10%
Unfilled deep-water holes = risk	65.70%
Falling into deep water, unable to swim = sign	78.20%
Cramps while swimming = a sign	75.50%
Do not play near open water	82.60%
Cover tanks/wells when not in use	69.20%
Do not swim during storm/heavy rain	14.40%

Intended practices for drowning prevention

The median intended practice score was 6.00 (IQR: 4.00–8.00), with no gender difference in median scores (both 6.00, but distribution differed; $p < 0.001$ by Wilcoxon rank-sum test). Table 3 summarises the proportion of students who selected each correct intended action.

For self-rescue during a drowning incident, the most commonly reported actions were: looking around for floating objects to hold onto (77.5%), staying calm and shouting for help (68.1%), and trying to float by taking a deep breath and relaxing (65.8%). For assisting a drowning victim, the most frequent correct responses were: staying calm and calling an adult (80.6%), looking for long sticks or floating objects to throw (68.5%), and instructing the victim to grab a stick or rope (65.7%). Worryingly, 17.1% reported they would jump into the water to save a friend even if they could not swim.

Table 3: Self-reported intended practices for drowning prevention

Intended action	% students
Self-rescue: look for floating objects	77.50%
Self-rescue: stay calm, shout, call an adult	68.10%
Self-rescue: try to relax and float	65.80%
Bystander: call an adult for help	80.60%
Bystander: throw a floating object or a stick	68.50%
Bystander: jump in to save (unsafe)	17.10%

Sources of drowning prevention information

Students obtained drowning prevention information from multiple sources, most commonly: television/books/newspapers (55.4%), classroom lectures (53.8%), and family members (53.8%). Females were significantly more likely than males to use family members and media sources ($p < 0.001$). Table 4 presents the full breakdown.

Table 4: Sources of drowning prevention information by gender

Source	Male (%)	Female (%)	Total (%)	p-value
Classroom lectures	51.6	56.1	53.8	0.039
Extracurricular lectures	39.6	40.4	40	0.705
Family members	49.7	57.9	53.8	<0.001
TV/books/newspapers	49.8	60.9	55.4	<0.001
Friends	28.3	32.9	30.6	0.022

Factors associated with knowledge and intended practices

Table 5 presents the results of Tobit regression analyses with cluster-robust standard errors. After adjusting for other factors, female gender was positively associated with knowledge (coefficient = 0.74; 95% CI: 0.49–0.99) but not with intended practice scores. Older age (14 years vs. 12 years) was associated with slightly lower intended practice scores (coefficient = –0.32; 95% CI: –0.57 to –0.07). Self-reported swimming ability was not significantly associated with either outcome in the adjusted models.

Several information sources were independently associated with higher knowledge scores: extracurricular lectures (0.41; 0.25–0.57), family members (0.38; 0.10–0.66), friends (0.44; 0.13–0.74), and media (0.63; 0.48–0.78). For intended practice scores, the strongest positive associations were also with media (0.88; 0.64–1.13), family members (0.55; 0.29–0.81), and extracurricular lectures (0.43; 0.17–0.69).

Table 5: Factors associated with drowning prevention knowledge and intended practices

Variable	Knowledge (Coef., 95% CI)	Intended practice (Coef., 95% CI)
Female (vs. male)	0.74*** (0.49, 0.99)	-0.06 (-0.29, 0.17)
Age 13 (vs. 12)	0.03 (-0.25, 0.31)	-0.21* (-0.47, 0.04)
Age 14 (vs. 12)	0.03 (-0.25, 0.31)	-0.32** (-0.57, -0.07)
Knows swimming (vs. no)	-0.08 (-0.33, 0.17)	0.10 (-0.13, 0.34)
Extracurricular lectures	0.41*** (0.25, 0.57)	0.43*** (0.17, 0.69)
Family members	0.38*** (0.10, 0.66)	0.55*** (0.29, 0.81)
TV/books/newspapers	0.63*** (0.48, 0.78)	0.88*** (0.64, 1.13)
Friends	0.44*** (0.13, 0.74)	0.06 (-0.22, 0.34)

***p<0.01, **p<0.05, *p<0.1. Coefficients are from Tobit models with cluster-robust standard errors (school level). Intraclass correlation coefficient (ICC) for knowledge = 0.03, for practice = 0.04.*

Discussion

This baseline assessment of 2,160 rural Vietnamese secondary school students revealed three key findings. First, while students possessed moderate theoretical knowledge of drowning risks and prevention (median 6.8/10), their intended practices for self-rescue and bystander response were considerably lower (median 6.0/10). Second, there was a striking gender gap in both knowledge and swimming ability (girls had better knowledge but far lower swimming competency), yet intended practices did not differ by gender. Third, diverse information sources, especially family members, extracurricular lectures, and media, were strongly associated with higher knowledge and better intended practices, suggesting that multi-channel educational interventions may be particularly effective.

Knowledge-practice gap and practical skill deficits

The discrepancy between knowledge and intended practices observed here aligns with

findings from other LMIC settings (14, 16). Students could correctly identify dangerous water bodies and basic preventive measures (e.g., not playing near open water), but fewer than 20% of students reported that they would avoid swimming during storms or refrain from romping while swimming – behaviours that are common in rural adolescent peer groups. This pattern suggests that theoretical water safety education, while necessary, is insufficient to change behavioural intentions. Effective drowning prevention programs must incorporate practical, scenario-based training that simulates real-life emergencies (17, 18).

The low proportion of students who could swim (39.4%, with only 19.9% of girls) is particularly concerning, given that basic swimming and survival floating skills are among the most protective factors against drowning (4, 19). In rural Vietnam, access to formal swimming lessons is extremely limited, and cultural norms may restrict girls' participation in aquatic activities. Future interventions should prioritise equitable access to swimming instruction for both genders, possibly through school-based or community-pool programs.

Gender differences: knowledge without corresponding practice

Females had significantly higher knowledge scores than males, but their intended practice scores were no different. This paradoxical finding may be explained by the fact that females also had much lower swimming ability and less exposure to water environments, meaning they might have had fewer opportunities to apply their knowledge. Alternatively, social desirability bias could have inflated females' knowledge responses, while their practice intentions remained realistic. Qualitative research would help elucidate whether this gap reflects a lack of confidence, restricted access, or different risk perception between genders.

The role of information sources

Our finding that family members, extracurricular activities, and media are strongly associated with both knowledge and intended practices has important programmatic implications. School-based classroom lectures alone had only modest associations, whereas extracurricular (i.e., non-curricular) lectures showed stronger effects. This suggests that voluntary, interactive, and less formal educational settings may engage students more effectively. Similarly, the powerful association with media (television, books, newspapers) highlights an opportunity for mass-media drowning prevention campaigns, particularly in rural areas where other forms of public health messaging may be limited. In Vietnam, public service announcements on television have been successful for other injury prevention topics (e.g., traffic safety), and similar approaches could be adapted for drowning prevention.

Comparison with previous studies

Our baseline knowledge scores (median 6.8/10) are like those reported among secondary students in Hanoi (mean 6.5/10) (14) but lower than those in a Thai study after intervention (8.2/10) (12). This reinforces the need for structured programs in rural Vietnam. Notably, a recent cluster-randomised trial in rural China demonstrated that a community-based intervention combining swimming lessons, safety education, and environmental modifications reduced drowning rates by 48% (20). The current trial, which will evaluate a school- and community-based intervention, is well-positioned to add Vietnamese evidence to this growing literature.

Strengths and limitations

Strengths include the large sample size, the cluster-randomised design, the use of cluster-adjusted analyses, and the focus on a hard-to-reach rural population. The questionnaire underwent content validity assessment and pilot testing, with acceptable internal consistency.

However, several limitations must be acknowledged. First, the instrument was not previously validated in this population; although we report CVI and Cronbach's alpha, further validation in other rural Vietnamese settings is needed. Second, the outcome measures rely on self-reported intentions, not observed behaviours. We have therefore used the term "intended practices" throughout, but future studies should include direct observation or objective assessment of water safety skills. Third, the sample was drawn from only one province in northern Vietnam; generalisability to other regions (e.g., the Mekong Delta) requires confirmation. Fourth, the cross-sectional design precludes causal inference; associations with information sources could be bidirectional (students who are more interested in safety may seek out more information). Fifth, despite using cluster-robust standard errors, the small number of clusters (six schools) may limit the precision of these adjustments; larger cluster trials are recommended. Sixth, we did not assess water exposure frequency or previous drowning incidents, which could confound the observed associations. Seventh, the 10% relative precision used in sample size calculation is wider than conventional (5%), and the achieved sample was 6.7% below the target; however, post-hoc power

analysis suggested adequate power for main comparisons.

Future directions
Future analyses from this trial will evaluate the effectiveness of the swimming and water safety intervention on knowledge, practices, and, where feasible, observed water safety behaviours. Researchers should also consider adding objective swimming competency tests (e.g., 25-m swim, float for 1 minute) and should collect data on water exposure hours and supervision levels. Given the strong association with media, a separate mass-media intervention component could be tested in a future factorial design. Finally, implementation research is needed to understand how best to integrate drowning prevention into the Vietnamese school curriculum without overburdening teachers.

Conclusion
Baseline findings from this cluster-randomised trial reveal substantial gaps in drowning prevention knowledge and, more critically, in intended safety practices among rural Vietnamese secondary school students. While students possess moderate theoretical awareness, their practical skills for self-rescue and safe bystander response are inadequate. Female students have better knowledge, but equally low intended practices and far lower swimming ability. Information from family members, extracurricular lectures, and media is strongly associated with better outcomes, suggesting that multi-channel, interactive educational approaches may be most effective. Policymakers and school administrators should prioritise equitable access to swimming lessons and practical water safety training, especially for girls, and should leverage community-based communication channels to reinforce safety messages. These baseline data provide an essential benchmark for the ongoing trial and for future drowning prevention efforts in rural LMIC settings.

List of Abbreviations
CI: Confidence interval
CVI: Content validity index
GEE: Generalised estimating equations
ICC: Intraclass correlation coefficient
IQR: Interquartile range
LMICs: Low and middle-income countries
RCT: Randomised controlled trial
SD: Standard deviation
WHO: World Health Organisation

Declarations
Ethics Approval and Consent to Participate
This study was approved by the Institutional Review Board of Vietnam - Korea Institute for Medical and Pharmaceutical Research and Training (Decision No.55/VKIM-HDDD). Written informed consent was obtained from the parent or legal guardian of each participating student. Written assent was obtained from each student. All procedures were conducted in accordance with the ethical standards of the Helsinki Declaration (2013 revision).

Consent for Publication
All authors gave consent for the publication of this work under the Creative Commons Attribution Non-Commercial 4.0 International (CC BY-NC 4.0) license.

Data Availability
The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.

Competing Interests
The authors declare no competing interests.

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Author Contributions
VLG worked on the conceptualisation, methodology, formal analysis, writing the original draft, writing the review & editing and funding acquisition.
NVD worked on the methodology, investigation, supervision, writing the review and editing.
VHM worked on the conceptualisation, methodology, investigation, project administration, writing the review & editing and supervision.

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References
1. Idris AH, Bierens JJ, Perkins GD, Wenzel V, Nadkarni V, Morley P, Warner DS, Topjian A,

Venema AM, Branche CM, Szpilman D. 2015 revised Utstein-style recommended guidelines for uniform reporting of data from drowning-related resuscitation: an ILCOR advisory statement. Circulation: Cardiovascular Quality and Outcomes. 2017 Jul;10(7):e000024. https://doi.org/10.1161/HCQ.0000000000000024
2. World Health Organization. Global report on drowning: preventing a leading killer. World Health Organization; 2014.
3. Franklin RC, Peden AE, Hamilton EB, Bisignano C, Castle CD, Dingels ZV, Hay SI, Liu Z, Mokdad AH, Roberts NL, Sylte DO. The burden of unintentional drowning: global, regional and national estimates of mortality from the Global Burden of Disease 2017 Study. Injury Prevention. 2020 Oct 1;26(Suppl 2):i83-95. https://doi.org/10.1136/injuryprev-2019-043484corr1
4. Thu HD, Viet CP, Khanal A. 118 National standardised survivial swim program to prevent child drowning in Vietnam. Injury Prevention. 2022 Nov 1;28(Suppl 2):A17-8. https://doi.org/10.1136/injuryprev-2022-safety2022.53
5. Rahman A, Peden AE, Ashraf L, Ryan D, Bhuiyan AA, Beerman S. Drowning: global burden, risk factors, and prevention strategies. Oxford University Press; 2021. https://doi.org/10.1093/acrefore/9780190632366.013.307
6. Linnan M, Rahman A, Scarr J, Reinten-Reynolds T, Linnan H, Rui-Wei J, Mashreky S, Shafinaz S, Bose S, Finkelstein E, Rahmank F. Child Drowning: Evidence for a newly recognized cause of child mortality in low and middle income countries in Asia. UNICEF. 2012.
7. Vietnam Health Environment Management Agency. Injury Mortality Statistics in 2012. Hanoi: VHEMA; 2013.
8. Boufous S, Ali M, Nguyen HT, Stevenson M, Vu TC, Nguyen DT, Ivers R, Pham CV, Nguyen AT. Child injury prevention in Vietnam: achievements and challenges. International Journal of Injury Control and Safety Promotion. 2012 Jun 1;19(2):123-9. https://doi.org/10.1080/17457300.2011.603426
9. Nguyen TL, Nguyen TH, Morita S, Sakamoto J. Injury and pre-hospital trauma care in Hanoi, Vietnam. Injury. 2008 Sep 1;39(9):1026-33. https://doi.org/10.1016/j.injury.2008.03.011
10. Turgut T, Yaman M, Turgut A. Educating children on water safety for drowning prevention. Social Indicators Research. 2016 Nov;129(2):787-801. https://doi.org/10.1007/s11205-015-1109-0
11. Kim B, Jung JH, Kim SY. Impact of survival swimming experience on positive emotions, self-efficacy, and safety behaviors among swimming Club members in Korea. Iranian Journal of Public Health. 2022 Nov;51(11):2528. https://doi.org/10.18502/ijph.v51i11.11170
12. Kusol K, Phromphen C, Eksirinimit T. Effects of potential support program on drowning prevention among primary school students in Nakhon Si Thammarat Province, Thailand. Sustainability. 2022 Sep 19;14(18):11717. https://doi.org/10.3390/su141811717
13. Meng R, Xu H, Zhang M, Ye P, Zhou Z, Zhu X, Li X, Lin L. Effect of integrated intervention to prevent child drowning in rural areas of Guangdong, China: a cluster randomized controlled trial. Journal of Tropical Pediatrics. 2023 Jun 1;69(3):fmad012. https://doi.org/10.1093/tropej/fmad012
14. Nguyen HL, Tran TH. Knowledge, attitude and practice on drowning prevention of students at Nguyen Van Huyen Secondary School, Hoai Duc District, Hanoi City in 2020. J Health Dev Stud. 2021;5(1):32-40.
15. Anh TTQ. Knowledge, attitude, practice of drowning prevention of students at Tho Xuan Secondary School, Dan Phuong, Hanoi in 2022 and associated factors. [thesis]. Hanoi: Thang Long University; 2023.
16. Willcox-Pidgeon SM, Peden AE, Scarr J. Exploring children's participation in commercial swimming lessons through the social determinants of health. Health Promotion Journal of Australia. 2021 Apr;32(2):172-81. https://doi.org/10.1002/hpja.335
17. Rejman M, Kwaśna A, Chrobot M, Kjendlie PL, Stalmann RK. Perceived versus real swimming skills of adolescents under standard and challenging conditions: Exploring water competencies as an approach to drowning prevention. International Journal of Environmental Research and Public Health. 2020 Jun;17(11):3826. https://doi.org/10.3390/ijerph17113826
18. Jamaludin TS, Nurumal MS, Hasan MK, Firdaus MK, Rahman NH. Knowledge and Practice of Cardiopulmonary Resuscitation (CPR) For Drowning Among Primary School Children. International Journal of Care Scholars. 2022 Jul 31;5(2):35-45. https://doi.org/10.31436/ijcs.v5i2.246
19. Santibañez-Gutierrez A, Fernández-Landa J, Calleja-González J, Todorović N, Ranisavljev M, Štajer V, Anđelić B, Zenić N, Bianco A, Drid P. Epidemiology of children's swimming

competence and water safety. Frontiers in Public Health. 2022 Jul 22;10:961342. https://doi.org/10.3389/fpubh.2022.961342

20. Rahman F, Bose S, Linnan M, Rahman A, Mashreky S, Haaland B, Finkelstein E. Cost-effectiveness of an injury and drowning prevention program in Bangladesh. Pediatrics. 2012 Dec 1;130(6):e1621-8. https://doi.org/10.1542/peds.2012-0757