

EFFECTIVENESS OF SCHOOL AND COMMUNICATION-BASED INTERVENTIONS FOR THE PREVENTION OF BURNS AMONG SECONDARY SCHOOL STUDENTS IN VU THU DISTRICT, THAI BINH PROVINCE

Vu Gia Linh^{1,✉}, Vu Minh Hai², Nguyen Dang Vung¹

¹*School of Preventive Medicine and Public Health, Hanoi Medical University*

²*Department of Trauma, Thai Binh University of Medicine and Pharmacy*

The study aimed to evaluate the effectiveness of school- and community-based interventions in improving knowledge and practice of burns prevention for secondary school students in Vu Thu district, Thai province. We conducted a controlled community trial in the Vu Thu district, Thai Binh province. The self-administered structured questionnaire, which was developed under the instruction of experts in burn injury prevention, and the information page of the Ministry of Health and the Ministry of Education and Training, was used in this study. The effectiveness of the intervention was evaluated by comparing the effectiveness index before and after the intervention between the intervention group and the control group. Among 2028 secondary school students, the score of knowledge about burn prevention in the control group and the intervention group increased after intervention (from 6.238 ± 2.050 to 6.847 ± 2.033 and from 6.257 ± 2.112 to 7.314 ± 1.824 , respectively). Knowledge scores on recognizing the causes and ways to prevent burns tend to increase after the intervention, especially in students with higher knowledge scores on these two topic groups than the control group. It is similar to the score of practice in preventing burn injuries, from 6.047 ± 3.582 to 6.247 ± 3.660 in the control group and from 6.638 ± 3.411 to 7.342 ± 3.207 in the control group. The effectiveness of the intervention has contributed to increasing secondary school students' knowledge and practice of preventing injuries caused by burns. Therefore, it is necessary to continue research in secondary schools, especially in suburban areas and other provinces, to obtain reliable evidence for policy development and planning for injury prevention - burning injuries.

Keywords: Burns, School-based interventions, Community-based interventions, Secondary school students.

I. INTRODUCTION

According to a report by the World Health Organization (WHO), burns are one of the common causes of non-fatal injuries in children.¹ This condition not only causes physical pain but can also have profound psychological and social consequences.² For children and students, burns are one of the most acute and

severe health problems, yet they have not received enough attention. It is also a problem of concern at both the national and international levels of economics and in the Vietnamese context. In Bangladesh, Colombia, Egypt, and Pakistan, 17% of burned children had temporary disabilities, and 18% had permanent disabilities.³ In Vietnam, an estimated 80,000 to 100,000 people suffer from burn injuries each year, and burns account for 1% of all causes of death due to all types of injuries in children and adolescents.⁴ The leading causes of burns in children and students include exposure

Corresponding author: Linh Gia Vu

Hanoi Medical University

Email: linhvugia.hmu@gmail.com

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to fire, hot water, chemicals, and other hot materials, especially during daily activities at home, school, or in the workplace. Children are susceptible to burns due to their limited knowledge, lack of injury awareness, insufficient first aid knowledge, and limited ability to respond promptly to situations that cause burns. These factors make it difficult for children to recognize potential hazards, understand the severity of burn injuries, and know the appropriate actions to take in preventing and managing burns.⁵⁻⁷

Improving students' knowledge, attitudes, and practices of preventing burn injuries is integral to protecting children's health and safety in the school environment.^{8,9} However, the lack of knowledge and awareness about the risk of burns and understanding how to prevent and treat burns remains a significant challenge. In particular, the target audience is secondary school students with changing age characteristics, a love of exploration, and a lack of vigilance; the risk of participating in unsafe activities is higher, so raising awareness and implementing practice needs to be associated with a process of practical experience and specific education to change attitudes and behaviors, especially requiring coordination between schools and families in the intervention process to create a learning and learning safety environment.

In Vietnam, research on interventions to improve knowledge and practices in preventing burn injuries is still limited and has not contributed to the development of management and education in schools and communities on burn injuries in students. Therefore, this study evaluated the effectiveness of school- and community-based interventions in improving knowledge and practice of burn prevention among secondary school students in Vu Thu district, Thai province.

II. MATERIAL AND METHOD

1. Research subjects

The participants of this study were secondary school students from grades 6 to 8 at 06 secondary schools in Vu Thu district, Thai Binh province. Students were included in the study when they met the following inclusion criteria: (1) aged from 12 to 14 (corresponding to 6th to 8th grade), (2) studying in selected schools, and (3) consenting to be the study participant. Informed consent was given to selected school principals, teachers, students, and their parents/guardians before collecting data.

2. Research methods

We conducted a controlled community trials study from September 2022 to September 2023 to evaluate the effectiveness of school- and community-based interventions in improving knowledge and practice of burn prevention among secondary school students in Vu Thu district, Thai Binh province.

In this study, we used randomized sampling to select participants. Firstly, we randomly selected six communes from 30 communes in the Vu Thu district, Thai Binh province. In each commune, there is a secondary school. Then, we selected all secondary school students from grade 6 to grade 8. By the end of the sample recruitment period, we recruited 2160 secondary students and performed a baseline assessment. We used Excel software to randomized communes into the control arm (n=1067 students) and the intervention arm (n=1093 students). After six months of the intervention, we excluded 132 secondary school students who were loss to follow-ups (loss rate of 6.11%). Finally, data were analyzed from 2028 secondary school students, with 979 in the intervention arm and 1049 in the control arm.

Intervention

Participants in the intervention group would receive health education communication to promote knowledge and practice about preventing burn injuries; meanwhile, students in the other group would not receive any intervention. The intervention composed of indirect intervention during 3-month summer vacation (from June to August), including leaflets, banners, posters, and loud speakers radio broadcast 2 to 3 times daily. direct intervention included three health education sessions organized by experts in burn injury prevention (one session for each secondary school) before summer vacation. The content of the session was about burn injury prevention. The experts would provide the burn situation and cause and effect of burn injuries. Moreover, the expert would provide situations related to burn wound management and let students role-play to resolve these situations. The contents about burn injury prevention were built based on the instructions of propaganda articles, and information provided by the Ministry of Health, Ministry of Education and Training, schools or communes, etc.

Data Collection and Measurement

Students' data were collected anonymously using a self-administered structured questionnaire. This questionnaire was developed under the instruction of experts in burn injury prevention and the information provided by the Ministry of Health and the Ministry of Education and Training. Before collecting data, we piloted the questionnaire at a secondary school that would not participated in the study to resolve logical issues and adjust questions to improve accuracy. We collected data at baseline and 6-month follow-ups

Socio-demographic characteristics: we included specific questions to measure socio-

demographic characteristics, including gender (male/female), age of participants, parent's occupation, and number of family members.

Knowledge and practice about burn prevention questions: To identify the knowledge and practice about burn injury prevention, we asked participants a series of multiple-choice questions about:

Questions about knowledge of burn prevention include 02 sections: knowledge about the causes and knowledge about first aid with burns. There are eight questions regarding the cause of burns, and students would receive 1 point for each choice. Regarding knowledge about first aid to burn, students would choose the correct answers in eleven ideas, equivalent to eleven initial first aid steps when experiencing an accident caused by burns. They would receive 1 point for each correct choice and 0 for each incorrect choice. The maximum score for proper first aid practice when encountering burns was 8 points. The score of knowledge about burn prevention was a sum of two sections, then transferred to a score of 10.

Questions about practice for burn prevention included nine questions, and students would receive 1 point for the correct answer. The maximum score for practice burn prevention is 9, then the score of practice would be transferred to a score of 10.

3. Data analysis

After being collected, the data was cleaned and entered into Epidata 3.1 software with reasonable and logical steps in the question set to avoid errors during the data entry process. The data would be analyzed by using STATA 17.0 software. Descriptive statistics include mean and standard deviation for quantitative and frequency variables and percentage for qualitative variables. Inferential statistics include non-parametric Rank-sum tests for quantitative

variables and Chi-square for qualitative variables. Evaluate the effectiveness of the intervention by comparing the effectiveness index before and after the intervention between

the intervention group and the control group using the statistical algorithm according to the formula:

$$\text{Effectiveness index (E.I.)}(\%) = \frac{p_2 - p_1}{p_1} \times 100$$

In which p_1 is the percentage before intervention and p_2 is the percentage after intervention

Intervention effectiveness was evaluated according to the formula:

Intervention effectiveness (I.E.) = E.I. of intervention group – E.I. of the control group

4. Ethical Approval

Before implementing the survey, we contacted and sent an information package to the principals of selected schools, teachers, students, and their parents/guardians. Each package contained information about the study's purposes, designs, inclusion criteria, and potential benefits and harms when participating. We also underlined that students' participation was not mandated, and they could withdraw from the study without any influence on the current relationships between students and schools. They could also skip questions that they did not want to answer. We did not collect individual

data for confidentiality; hence, re-identifying students' identifications is impossible. The Institutional Review Board approved the study protocol for Ethics in Biomedical Research-Hanoi Medical University under Decision No. 658/GCN-HDDDNCYSHĐHYHN. This study was performed according to the Helsinki Declaration guideline.

III. RESULTS

Table 1 shows the socio-demographic characteristics of respondents. Out of 2028 respondents, half of them were male. Most secondary school students had their parents' occupations being blue-collar workers, followed by business, freelance, and white-collar workers. 57.73% of students live in families with 5-7 members, and 39.10% live in families with 2-4 members. There was no -significant difference in characteristics of students in the control and intervention group, except for the father's and mother's occupation.

Table 1. Characteristics of students in the control group and intervention group

Characteristics	Group				Total		p-value
	Control		Intervention		n	%	
	n	%	n	%			
Total	1049	51.73	979	48.27	2028	100.00	
Gender							
Male	524	49.95	489	49.95	1013	49.95	0.999
Female	525	50.05	490	50.05	1015	50.05	

Characteristics	Group				Total		p-value
	Control		Intervention		n	%	
	n	%	n	%			
Age (units: years)							
12 years old	374	35.65	311	31.77	685	33.78	0.154
13 years old	328	31.27	335	34.22	663	32.69	
14 years old	347	33.08	333	34.01	680	33.53	
Father's occupation							
White-collar worker	44	4.26	56	5.83	100	5.02	0.006
Blue-collar worker	746	72.15	628	65.42	1374	68.91	
Business	102	9.86	138	14.37	240	12.04	
Freelance	72	6.96	74	7.71	146	7.32	
Others	70	6.77	64	6.67	134	6.72	
Mother's occupation							
White-collar worker	74	7.13	92	9.50	166	8.28	0.001
Blue-collar worker	772	74.37	638	65.91	1410	70.29	
Business	93	8.96	113	11.67	206	10.27	
Freelance	75	7.23	100	10.33	175	8.72	
Others	24	2.31	25	2.58	49	2.44	
Family member							
2-4 members	364	38.89	334	39.34	698	39.10	0.846
5-7 members	544	58.12	486	57.24	1030	57.70	
8 members and above	28	2.99	29	3.42	57	3.19	

Table 2 presents the effectiveness of interventions to change knowledge and practice about burn prevention among secondary school students. The score related to knowledge about the causes of burns, knowledge about first aid with burns, and practice about burns prevention increased in both the intervention and control groups, with a tremendous increase in practice about burn prevention, followed by knowledge about first aid with burns and knowledge about the causes of burns. The score of knowledge

and practice about burn prevention in students receiving interventions is higher than those who did not. Moreover, there were statistically significant differences in the score of knowledge and practice toward preventing burns between baseline and follow-up in both students in the control and intervention groups. Additionally, in the intervention group, the average score of knowledge and practice is from 0.213 to 0.536 standard deviations higher after receiving interventions.

Table 2. Effectiveness change in knowledge and practices regarding burn prevention in both the control and intervention groups

Characteristics	Control group				Intervention group			
	Baseline	Follow-up	p-value	Cohen's d	Baseline	Follow-up	p-value	Cohen's d
	Mean (SD)	Mean (SD)			Mean (SD)	Mean (SD)		
Knowledge about burn prevention (score: 0-10)	6.238 (2.050)	6.847 (2.033)	< 0.001	0.298	6.257 (2.112)	7.314 (1.824)	< 0.001	0.536
Knowledge about the causes of burns	3.428 (2.093)	3.817 (2.209)	< 0.001	0.181	3.741 (2.047)	4.463 (2.023)	< 0.001	0.355
Knowledge about first aid with burns	5.929 (2.014)	6.454 (1.867)	< 0.001	0.270	5.974 (3.070)	6.608 (2.886)	< 0.001	0.436
Practice about burn prevention (score: 0-10)	6.047 (3.582)	6.247 (3.660)	0.110	0.055	6.638 (3.411)	7.342 (3.207)	< 0.001	0.213

In the intervention group, research results revealed that following the intervention, the percentage of students with knowledge about the causes of burns changed compared to before the intervention. Particularly noteworthy was the rise in awareness among students regarding the causes of burns, including electric shock, inhalation of excessive gas or so hot

steam, and boiling water cups, which exhibited more significant increases than other causes. In the control group, there was also an increase in the percentage of students with knowledge about the causes of burns at the follow-up time, albeit at a lower rate of change than the intervention group. **(Table 3)**

Table 3. Effectiveness change in knowledge about causes of burns characteristics

Characteristics	Control group			Intervention group			I.E. (%)	
	Baseline n (%)	Follow-up n (%)	p-value	Baseline n (%)	Follow-up n (%)	p-value		E.I. (%)
Types of stoves (such as gas stoves, coal stoves, wood stoves)	863 (82.27)	862 (82.17)	0.954	833 (85.09)	878 (89.68)	0.002	5.39	5.52
Contact with freshly cooked food and beverages	587 (55.96)	693 (66.06)	< 0.001	631 (64.45)	743 (75.89)	< 0.001	17.75	-0.30
Electric shock	316 (30.12)	378 (36.07)	0.004	310 (31.66)	428 (43.72)	< 0.001	38.09	18.34
Exposure to acids and chemicals	498 (47.47)	591 (56.39)	< 0.001	506 (51.69)	651 (66.50)	< 0.001	28.65	9.86
Inhalation of excessive gas or so hot steam	269 (25.64)	353 (33.68)	< 0.001	258 (26.35)	362 (36.98)	< 0.001	40.34	8.98
Contact with hot irons during iron	565 (53.86)	608 (58.02)	0.055	609 (62.21)	708 (72.32)	< 0.001	16.25	8.53
Boiling water cups	206 (19.64)	251 (23.95)	0.017	199 (20.33)	287 (29.32)	< 0.001	44.22	22.28
Thermoses containing boiling water	498 (47.47)	517 (49.33)	0.395	515 (52.60)	599 (61.18)	< 0.001	16.31	12.39

* *E.I.*: Effectiveness index; *I.E.*: Intervention effectiveness

In the intervention group, there was an increase with statistical significance in the proportion of students correctly knowledgeable about first aid with burns after the intervention ($p < 0.001$). Meanwhile, the proportion of students engaging in incorrect knowledge about first aid to burn injuries, such as inserting sharp objects into burns, applying fish sauce, or using leaves, tended to decrease post-intervention. In contrast, in the control group, there was a notable increase in the proportion of students with incorrect knowledge about first aid at the follow-up compared to baseline, including using sharp objects, fish sauce, or leaves for burns ($p < 0.001$). (Table 4)

Table 4. Effectiveness change in knowledge about first aid with burns

Characteristics	Control group				Intervention group				
	Baseline		Follow-up		Baseline		Follow-up		I.E. (%)
	n (%)	n (%)	p-value	E.I. (%)	n (%)	n (%)	p-value	E.I. (%)	
Offer the victim water to drink and lay them in a supine position	501 (47.76)	690 (65.78)	< 0.001	37.73	439 (44.84)	612 (62.51)	< 0.001	39.41	1.68
Cool the burn with clean running water	844 (80.46)	902 (85.99)	0.001	6.87	734 (74.97)	855 (87.33)	< 0.001	16.49	9.61
Transport the victim to the nearest medical facility	918 (87.51)	953 (90.85)	0.014	3.82	839 (85.70)	902 (92.13)	< 0.001	7.50	3.69
Cover the burn with a sterile cloth or bandage	723 (68.92)	800 (76.26)	< 0.001	10.65	622 (63.53)	699 (71.40)	< 0.001	12.39	1.74
Remove any items like shoes, sandals, bracelets, etc., from the affected area	735 (70.07)	818 (77.98)	< 0.001	11.29	632 (64.56)	758 (77.43)	< 0.001	19.93	8.65
Call for assistance from adults	749 (71.40)	785 (74.83)	0.076	4.80	678 (69.25)	814 (83.15)	< 0.001	20.07	15.27
Move the victim away from the source of the burn	868 (82.75)	909 (86.65)	0.013	4.71	783 (79.98)	871 (88.97)	< 0.001	11.24	6.53
Using sharp objects (wood, plastic, metal) to pierce the burn	258 (24.59)	377 (35.94)	< 0.001	46.16	190 (19.41)	180 (18.39)	0.564	-5.26	-51.41
Keep the victim calm	881 (83.98)	913 (87.04)	0.047	3.64	799 (81.61)	860 (87.84)	< 0.001	7.63	3.99
Apply fish sauce or leaves to the burned area	250 (23.83)	349 (33.27)	< 0.001	39.61	182 (18.59)	143 (14.61)	0.018	-21.41	-61.02
Using cold water or ice from the refrigerator to cool the burn	758 (72.26)	742 (70.73)	0.439	-2.12	668 (68.23)	505 (51.58)	< 0.001	-24.40	-22.29

* E.I.: Effectiveness index, I.E.: Intervention effectiveness

Table 5 shows the effectiveness of change in practices regarding burn prevention. After the interventions, students significantly improved their practice regarding burn prevention. In addition, most of these differences are statistically significant, with $p < 0.005$. In the intervention group, “Ensure the stove and cooking utensils are placed out of children’s reach”, “Avoid exposing children to objects that can cause burns, such as lighters, matches, candles,” and “Prevent children from playing in or near the cooking area” were the most highly reported by respondents (82.12%, 77.83% and 74.26% respectively). After interventions, the characteristics of practices regarding burn prevention include “Utilize outlet covers”, “Check the temperature of water/food before consumption to prevent burns”, and “Test the faucet temperature before use” which were reported increasingly by respondents. In contrast, in the control group, the percentage of students who demonstrated changes in practice regarding burn prevention was insignificant at the follow-up time compared to the baseline.

Table 5. Effectiveness of change in practices regarding burn prevention characteristics

Characteristics	Control group			Intervention group			I.E. (%)
	Baseline n (%)	Follow-up n (%)	p-value	Baseline n (%)	Follow-up n (%)	p-value	
Ensure the stove and cooking utensils are placed out of children’s reach	829 (79.03)	813 (77.58)	0.420	804 (82.12)	853 (87.13)	0.002	6.10
Keep items containing hot solutions out of children’s reach	713 (67.97)	711 (67.84)	0.951	714 (72.93)	791 (80.80)	< 0.001	10.79
Install electrical outlets at a height inaccessible to children	564 (53.77)	599 (57.16)	0.118	583 (59.55)	644 (65.78)	0.004	10.46
							7.94
							4.16

Characteristics	Control group			Intervention group			I.E. (%)	
	Baseline n (%)	Follow-up n (%)	p-value	Baseline n (%)	Follow-up n (%)	p-value		E.I. (%)
Utilize outlet covers	515 (49.09)	568 (54.20)	0.019	527 (53.83)	630 (64.35)	< 0.001	19.54	9.13
Prevent children from playing in or near the cooking area	720 (68.64)	722 (68.89)	0.899	727 (74.26)	792 (80.90)	< 0.001	8.94	8.58
Avoid exposing children to objects that can cause burns, such as lighters, matches, candles	744 (70.92)	755 (72.04)	0.571	762 (77.83)	808 (82.53)	0.009	6.04	4.46
Check the temperature of water/ food before consumption to prevent burns	619 (59.01)	649 (61.93)	0.172	650 (66.39)	741 (75.69)	< 0.001	14.01	9.06
Test the faucet temperature before use	586 (55.86)	630 (60.11)	0.049	618 (63.13)	694 (70.89)	< 0.001	12.29	4.68
Never allow children to bathe unsupervised	419 (39.94)	445 (42.46)	0.241	464 (47.40)	516 (52.71)	0.019	11.20	4.89

* E.I.: Effectiveness index, I.E.: Intervention effectiveness

IV. DISCUSSION

Our research results show that the effectiveness of school- and community-based interventions has contributed to increasing the knowledge and practice of secondary school students on burn prevention. Knowledge scores on recognizing the causes of burns and ways to prevent burns tend to increase after the intervention, especially students in the intervention group who have higher knowledge scores on these two topic groups than the control group. After the intervention, the practice of first aid when witnessing an injury accident increased significantly.

Research results show that the rate of students knowing about the causes of burns is relatively high. The causes most known to many students are “Types of stoves (gas stoves, coal stoves, wood stoves, etc.) cook,”; “Food and drinks have just been boiled/cooked,” and “Iron is in use.” This rate is similar to the study of Vo Van Thanh and colleagues.¹⁰ After the intervention, the proportion of students with knowledge about the causes of burns tends to increase, with significantly less common causes such as “Electric shock,” “Acid, chemical,” or “Inhalation of gases, vapors.” “Water is too hot” is known and chosen by students. A correct understanding of the causes of burns helps students recognize and avoid the causes and risks of accidents and injuries while also helping to minimize the consequences after accidents and increasing the ability to prevent injuries—a safe environment for learning and playing. Learn about ways to avoid injuries caused by burns. The prevention methods chosen by most students include “Place the stove and cooking utensils out of reach of children”; “Avoid letting children come into contact with objects that can cause burns such as lighters, matches, candles, alcohol

lamps...”; “Place and keep items containing hot solutions out of reach of children.” The results showed that students knew well about staying away from burn-causing agents. In addition, although the measures “Cover electrical outlets” or “Check the temperature of water/food before eating/drinking to avoid burns” are not of interest to students, after the intervention, most students learned about these preventive measures in addition to the abovementioned measures. At this age group, children are at a formative stage where they can develop lifelong habits.¹¹⁻¹³ Educating them about burn causes, such as hot liquids, chemicals, open flames, and electrical hazards, can significantly reduce the incidence of burns by promoting cautious behavior.¹⁴⁻¹⁶ Moreover, adolescence is characterized by curiosity and sometimes risky behavior. Understanding the causes and consequences of burns can help mitigate these tendencies by fostering a greater appreciation for safety and precaution. Knowledge about burns can also empower students to make informed decisions and encourage their peers to do the same, creating a ripple effect of safe practices within the school environment and beyond. Additionally, integrating burn prevention education into the secondary school curriculum supports the broader objective of promoting public health. Burn injuries can lead to severe physical and psychological consequences, including long-term disability, scarring, and trauma. Educating students on how to prevent burns can reduce the incidence of such injuries, thereby lessening the burden on healthcare systems and improving overall community health outcomes.^{12,16} Students learn to identify potential hazards, assess risks, and develop strategies to avoid accidents, contributing to

their safety and preparing them for responsible adulthood, where they can apply these skills in various aspects of life.

For the hypothetical situation of practicing first aid on a person burned by hot water, most students choose “Take the victim to the nearest medical facility,” “Keep the victim calm,” or “Pull the victim away from the source of burns.” Initial treatment of a burn patient is essential to minimize damage and increase the chance of recovery after an accident. The study results are similar to other studies on the same topic.^{2,7,9,13} Pulling the victim away from the source of the burn should be the priority to prevent the spread of the burn wound and minimize damage to the skin and surrounding areas. Next are the initial treatment activities and ensuring the patient is alert, such as calling for help from people around, cleaning the burn wound, calming the victim, etc., and taking the victim to the nearest medical facility to treat the wound to avoid causing further damage later promptly.

The majority of students had correct practice when encountering burn injuries, but there is still a proportion of students who choose treatments that increase the severity of burn injuries. Misguided actions such as: “Pick up a sharp object (made of wood, plastic, metal, etc.), poke the burn” or “Apply water, take leaves and apply to the burned area” tended to increase when evaluated after three months in the control group which reflects a critical gap in practice preventing burn injuries. Actions like poking the burn with sharp objects can introduce infections and further damage the already compromised skin, such as more profound tissue damage, increased pain, and prolonged healing times. Similarly, applying non-sterile materials like leaves can introduce bacteria and other pathogens, significantly

increasing the risk of infection, while improper water use can worsen the injury. However, in the intervention group, the rate of choosing these behaviors tends to decrease significantly after receiving media education about injury prevention, including burns. That proves the effectiveness of the school- and community-based prevention programs that our research has implemented. Educating students about the risks associated with these harmful practices is crucial in ensuring they understand the importance of maintaining the integrity of the burn area.^{12,16,17} Comprehensive educational programs should include detailed lessons on burn prevention, hands-on first aid training, and practical simulations. Engaging families and communities through informational sessions and partnerships with local health organizations can reinforce correct practices. By addressing these educational gaps, schools and communities can significantly reduce the incidence of harmful burn treatment practices and ensure students are better prepared to manage burns safely and effectively.^{9,12,16}

In Vietnam, school- and community-based interventions in preventing burn injuries have been proven effective. However, these interventions focus on activities to improve awareness of burn injury prevention for students, teachers, and caregivers but neglect to recognize the necessity of extracurricular activities to assist students to master skills and actions in case of injury accidents. Our research combines the implementation of interventions in both schools and communities to improve knowledge and practice for secondary school students to prevent injuries caused by burns. In addition to indirect interventions through loudspeakers, leaflets, banners, and posters, students at secondary school participated in health education communication sessions

organized by experts with experience in injury prevention. In this session, besides knowledge about burn injury prevention, experts shared and let students join role-playing scenarios and practice ways to deal with burn injuries. Integrating knowledge and practices in burn injury prevention among secondary school students ensures they have the knowledge to prevent accidents and respond effectively to burn injuries. They can apply their knowledge in real-life situations, reducing the severity of injuries and improving outcomes. Additionally, peer education programs and community involvement extend the impact of these interventions beyond the classroom, reinforcing safe practices at home and in everyday life. Engaging families and local health organizations in educational efforts ensures consistent messaging and support, further enhancing the effectiveness of burn prevention strategies.

Our research still has certain limitations. Although the effectiveness of intervention measures to prevent injuries caused by burns has been discovered, due to limited resources, the research results are not representative of rural areas; they are only research results in one district. Second, confounding variables such as socioeconomic position, access to healthcare, and differences in educational quality were not entirely accounted for, which might have impacted the results. These characteristics can substantially affect the implementation and efficacy of burn prevention treatments;. Future studies should cover a wide geographical area and account for significant variables to increase the generalizability and robustness of our findings, resulting in a better understanding of the efficacy of burn injury prevention techniques across populations.

V. CONCLUSION

The effectiveness of the intervention in our study has significantly contributed to increasing secondary school students' knowledge and practice for preventing injuries caused by burns. Knowledge scores about the causes and ways to prevent burns tend to increase after the intervention, indicating a more profound understanding among students of how to avoid burn risks. Moreover, there has been a substantial improvement in first aid practices when encountering burn injuries, with a notable decrease in behaviors that could exacerbate the severity of these injuries in the intervention group. While the majority of students now demonstrate correct practices when dealing with burn injuries, it is concerning that a proportion of students in the control group still resort to harmful treatments. This highlights the critical need for broader implementation of these interventions to ensure all students have access to proper burn prevention education and training. Moreover, it is necessary to continue and expand research in secondary schools, particularly in suburban areas and other provinces, to obtain reliable evidence for policy development and planning to prevent injuries caused by burns. Improving knowledge and practice of burns prevention in secondary school students is crucial for promoting safe behaviors, reducing injury risks, and supporting broader public health and educational goals. This comprehensive approach will help tailor interventions to meet the unique needs of different communities, thereby enhancing their overall impact.

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