

## 학교내 응급상황에 대한 준비 실태와 보건교사의 응급처치 수행자신감

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### Preparation and Self-Confidence to Response to Emergent, Acute or Life-threatening Health Crisis among School Nurses in South Korea

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#### ABSTRACT

**배경 및 목적:** 본 연구는 학교 내 응급상황(천식 위기, 알레르기 반응, 저혈당 위기, 발작, 심폐정지, 출혈/골절, 머리/목 상해, 열성질환, 중독, 질식)에 대한 행정 차원과 물품구비 차원에서의 준비 실태, 그리고 응급처치 수행자신감을 파악하는데 목적이 있다.

**방법:** 단면조사연구로 274명의 보건교사를 대상으로 하였으며, 자가보고형 조사지를 이용하여 대상자와 학교의 일반적 특성, 학교 내 응급상황에 대한 행정·물품 준비 실태, 그리고, 응급처치 수행자신감 등 3개 영역의 자료를 수집하였다. 자료수집은 2018년 2월 1일부터 2018년 7월 31일까지 실시하였고, 자료분석은 기술통계, t-검정과 분산분석을 이용하였다.

**결과:** 대부분의 학교에서 응급상황 관리계획이 있었으나, 응급상황별로 천식 위기는 46.7%, 알레르기 반응은 58.4%에서만 관리계획을 갖추고 있었다. 산소, 혈당측정기, 자동제세동기, 경추고정장치 등은 85% 이상의 학교에서 보유하고 있었으나, 기관확장제 흡입기, 에피네프린 주사제, 흡입기 등은 거의 갖추고 있지 않았다. 응급상황 수행자신감은 5점 만점에 2.67점 (발작관리) 에서 3.55점 (심폐정지관리)이었으며, 일부 응급상황에 대해서 의료기관 근무경력이 증가함에 따라 수행자신감이 증가하였다.

**결론:** 대부분의 학교에서 응급관리계획을 수립하고 있었으나, 응급상황별 관리계획을 수립한 경우는 반 정도에 불과하였다. 보건교사의 학교 내 응급상황에 대한 응급처치 수행자신감은 전체적으로 낮게 나타남에 따라, 이들의 역량강화를 위한 체계적인 교육과 멘토링 프로그램이 요구된다.

**주제어:** 응급간호, 응급상황, 학교, 학교간호, 자신감

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## I. Introduction

School is a place where students spend long periods of time(Kim, 2015), and various accidents can occur due to the numerous physical activities of school-aged children and adolescents(Ryu & Lee, 2017). According to the national statistics in 2017, the occurrence of such accidents has increased sharply from 65,393 in 2009 to 108,458 in 2016 (School Safety and Insurance Federation, 2017), and accidents were the most common cause of death in children (Statics Korea, 2017). In addition, the numbers of children with chronic diseases such as asthma, allergic reactions, type I diabetes, and seizure are increasing in schools. In the survey for middle- and high-school students, the incidence of asthma steadily increased from 8.5% in 2007 to 9.1% in 2016 (Korea Centers for Disease Control & Prevention, 2019). And, the number of children with type I diabetes increased from 4,076 in 2006 to 5,338 in 2015, and adolescents accounted for 15% of the total cases of seizure in South Korea, 2015 (Korean National Health Insurance Corporation, 2016). As the number of children with chronic diseases increases, the risk of health crisis such as dyspnea, allergy, diabetic crisis, and seizures is also increasing (American Lung Association, 2018; Allen et al., 2012).

In Korea, government agencies working to create a safe school environment, and in order to effectively prepare for the health crises (Ministry of Education and Science Technology, 2019; Ministry of Health and Welfare, 2019).

Recently, the act on school health (article 15-2) was revised for school nurses to administer glucagon or epinephrine in the event of a diabetic crisis or allergic reaction, respectively (Ministry of Government Legislation, 2019a). However, there are several problems regarding the use of equipment or medication: legal issues in providing medical services outside hospitals, and lack of coping strategies and emergency equipment in case of adverse events in schools (MGL, 2019a; Odhav, Ciaccio, Serota, & Dowling, 2015; Yoon & Lee, 2017). As the act is enforced without resolving the problems, some schools have prepared their own response plan without clear guidelines (Yoon & Lee, 2017).

In Korea, the school principal takes ultimate responsibility for securing students' health and well-being throughout the school day with help of healthcare professionals, families, and community organizations (MGL, 2019a). Among them, school nurses who are called "school health teachers" are the only healthcare professionals physically presenting in schools and one of the full time teachers (MGL, 2019a), and take core roles to provide comprehensive health services to students under the authority of the principal by the law. Their roles are very similar to those of the National Association of School Nurses (NASN) in U.S. identified: direct care service, screening or referral service for health condition, health education and promoting programs, and creating a healthy and safe school environment (Breena, & Anne, 2016; Murray et al, 2008; MGL, 2019a). It is a basic but vital role of school nurses to provide proper treatment for health crises during the

school day (Breena, & Anne, 2016; Toresdahl, Harmon, & Drezner, 2013), but fear, anxiety, and lack of self-confidence in responding to health crises can prevent them to provide active and professional care (Greene, 2019; Stoodley, McKellar, Steen, & Fleet, 2020; Yoon & Lee, 2017). Therefore, this study aimed to identify the preparation in term of administrative and equipment preparation at the school level, and self-confidence of school nurses to respond to emergent, acute or life-threatening health crises on an individual level in South Korea.

## II. Methods

### 1. Participants

The accessible population of this cross-sectional study was 378 school nurses working at four types of school (elementary, middle, high, and special education schools) in Gyeongnam province, southeast part of South Korea. A total of 277 questionnaires were returned, and 274 were used for the analysis after excluding 3 incomplete questionnaires (response rate: 72.5%). Final participants consisted of 181 elementary, 36 middle, 53 high, and 4 special education school nurses.

### 2. Instruments

We used a self-administered questionnaire developed by Olympia, Wan, & Avner (2005). After obtaining permission from the tool developer, the questionnaire was translated into

Korean by two researchers and evaluated validity of vocabulary selection and clarity of meaning by two nurses who were fluent in both Korean and English. It was also culturally adapted by revising the qualification name according to Korean agencies and changing the child's name to a Korean name in the scenario depicting a health crisis situation. And, we added working years at hospitals and some type of special health care needs such as self-glucose monitoring, and removed the question on biochemical disaster preparation to the questionnaire.

The final questionnaire consisted of the general characteristics of schools and school nurses, administrative and equipment preparation for ten emergent, acute and life-threatening health crises in schools (asthma crisis, allergic reaction, diabetic crisis, seizure, cardiopulmonary failure, bleeding/fracture, head/neck injury, heat-related illness, poisoning, and choking), and self-confidence in responding to the health crises. General characteristics included age, educational background, working years in schools and hospitals, type of qualification, school type, number of students in the school, type of special health care needs, and annual incidence of the health crisis. Self-confidence in responding to the health crisis was asked "How confident are you in first-aid treatment when you are confronted with such a situation?" for ten health crises. Each item was answered on a 5-point Likert scale ranging from "not confident" to "very confident.". The internal consistency measured with Cronbach's  $\alpha$  was

.92 in total.

### 3. Data collection

Data collection was conducted from February 1 to July 31, 2018, after receiving approval from the P institutional review board (2017\_92\_HR). First, we obtained a school list where the school nurses were employed from Gyeongnam Office of Education. We uploaded the advertisement for this study on the intranet of the national educational information system, explaining the purpose and method of study in brief, along with our contact number. A total of 378 school nurses agreed to participate voluntarily through two times of advertisement, and we sent them informed consent form including study purpose, method, the guarantee of anonymity, and possibility of withdrawing, the questionnaire, an anonymized return envelope, and a gift (coasters) for their contribution through postal mail. After the questionnaire was completed, the participants returned the envelope enclosed with the consent form and the questionnaire directly to the researchers.

### 4. Data analysis

The collected data were analyzed with SPSS WIN 22.0 program. A two-tailed test was performed with a significance level ( $\alpha$ ) of 0.05. The general characteristics of schools and school nurses, administrative and equipment preparation for the health crisis and self-confidence in responding to the health crisis were analyzed using frequency and

percentage or mean and standard deviation. Self-confidence according to some of the general characteristics of the participants and administrative and equipment preparation was analyzed using t-test and ANOVA, followed by Scheffé's post-hoc test.

## III. Results

### 1. General characteristics of the participants and schools

Table 1 shows the general characteristics of the participants and schools. Mean age, teaching experience in schools, and working experience at hospitals was 46.3 years, 16.6 years, and 4.3 years, respectively. The most common type of special health care needs was insulin self-injection (36.8%), and 63.5% of schools had never reported the health crisis last year. The most common health crisis was fracture if reported.

### 2. Administrative and equipment preparation for the health crises in school

CPR training was given to teachers (94.5%) and students (64.6%), and 63.1% of the schools had no physicians appointed. Most schools (96.3%) had a response plan for the health crises, and 72.6% of them had connection between school and local EMS system. The major type of connection was by telephone (Table 2).

〈Table 1〉 General Characteristics of the Participants and Schools

		(N=274)	
Characteristics	Categories	N	%
Age (years)	Mean±SD	46.3±8.1	
Highest education level	3-year college	39	14.2
	4-year college	172	62.8
	Master's and higher	63	23.0
Working as school nurses (years)	Mean±SD	16.6±10.2	
Work experience at hospitals (years)	Mean±SD	4.3±4.5	
Have a qualification on life support	No	212	77.4
	Yes	62	22.6
Type of qualification on life support*(n=62)	Basic life support	44	71.0
	Advanced cardiac life support	3	4.8
	Korean advanced life support	2	3.2
	Others	15	24.2
School type	Elementary school	181	66.1
	Middle school	36	13.1
	High school	53	19.3
	Special education school	4	1.5
Number of students in schools	Mean±SD	543.2±328.7	
Type of special care needs	Glucose monitoring	46	34.6
	Insulin self-injection	49	36.8
	Bronchodilator MDI with spacer	16	12.0
	Epinephrine auto-injector	6	4.5
	Ventriculo-peritoneal shunt	4	3.1
	Others	12	9.0
Number of health crisis reported last year	0	174	63.5
	1-2	67	24.5
	≥3	33	12.0
	Mean±SD	0.8±1.4	
Health crisis reported last year* (n=232)	Fracture	174	75.0
	Head/neck injury	102	44.0
	Bleeding	94	40.5

SD=standard deviation; MDI=meter dose inhaler

\*multiple responses

〈Table 2〉 Administrative Preparation for Responding to the Health Crisis

		(N=274)	
Characteristics	Categories	n	%
CPR training recipients*	For teachers	259	94.5
	For students	177	64.6
	For administrative staff	130	47.4
	None	20	7.3
School physician appointed	Yes	97	35.4
	No	173	63.1
	Don't know	4	1.5
Have a response plan to the health crises at school level	Yes	264	96.3
	No	9	3.3
	Don't know	1	0.4
Have a response plan for each health crisis*	Asthma crisis	128	46.7
	Allergic reaction	160	58.4
	Diabetic crisis	133	48.5
	Seizure	129	47.1
Have connection between school and local EMS system	Yes	199	72.6
	No	74	27.0
	Don't know	1	0.4
Type of connection between school and local EMS system	By phone	265	96.7
	By automatic connecting system	8	2.9
	Others	1	0.4

CPR=cardiopulmonary resuscitation; EMS= emergency medical service

\*multiple responses

Most schools had sterile glove for bleeding/facture (92.0%), followed by glucose monitoring device for diabetic crisis (91.2%), but, only 5.5% had epinephrine injection for allergic reactions, 7.7% had suction device for seizures (Table 3).

〈Table 3〉 Equipment Preparation for Responding to the Health Crisis

		(N=274)	
Emergency situation	Categories	n	%
Asthma crisis*	Bronchodilator metered dose inhaler	92	33.6
	Oxygen	235	85.8
	None	6	2.2
Allergic reaction	Epinephrine autoinjector (Epi-pen)	15	5.5
	None	259	94.5

Emergency situation	Categories	n	%
Diabetic crisis*	Glucose monitoring device	250	91.2
	Glucose source for administration	206	75.2
	None	4	1.5
Seizure	Suction device	21	7.7
	None	253	92.3
Cardiopulmonary failure*	Automated external defibrillator	239	87.2
	Mouth-to-mouth mask	109	39.8
	Bag-valve-mask	86	31.4
	None	12	4.4
Bleeding/facture*	Sterile disposable gloves	252	92.0
	First aid kit	193	70.4
	Extremity splints/elastic bandages	234	85.4
	Sterile dressings (gauze/rolls)	237	86.5
	Face mask/shields	88	32.1
Head/neck injury*	Cervical spine collar	235	85.8
	Backboard with restraints	153	55.8
	None	17	6.2

\*multipl

### 3. Self-confidence in responding to the health crises

Self-confidence in responding to the health crises was the highest at 3.55 points for cardiopulmonary emergency, and the lowest for seizure at 2.67 points (Table 4). According to Table 5, the self-confidence in responding to asthma crisis ( $p<.001$ ), allergic reactions ( $p=.002$ ), diabetic crisis ( $p=.003$ ), seizures ( $p=.012$ ), head/neck injuries ( $p=.001$ ), and poisoning ( $p=.001$ ) was significantly higher in those who had four or more years of work experience at hospitals than those with no work experience. School nurses working at the schools having response plans showed significantly higher self-confidence in responding to diabetic

crisis ( $p=.038$ ), cardiopulmonary failure ( $p=.026$ ), head/neck injury ( $p=.032$ ), and choking ( $p=.024$ ).

〈Table 4〉 Self-Confidence in Responding to the Health Crisis

(n=274)		
Emergency	Mean ± SD	Rank
Asthma crisis	3.16 ± 0.94	7
Allergic reaction	3.06 ± 0.98	9
Diabetic crisis	3.47 ± 0.87	3
Seizure	2.67 ± 1.08	10
Cardiopulmonary failure	3.55 ± 0.94	1
Bleeding/facture	3.47 ± 0.87	4
Head/neck injury	3.23 ± 0.95	6
Heat related illness	3.38 ± 1.01	5
Poisoning	3.09 ± 0.94	8
Choking	3.49 ± 0.99	2

SD=standard deviation

〈Table 5〉 Self-Confidence in Responding to the Health Crisis according to General Characteristics

(N=274)

Emergency	Work years at hospitals (Mean±SD)					Have qualification on life support (Mean±SD)				Has a planning on responding to health crises at school level (Mean±SD)			
	0(a)	1-3(b)	≥4(c)	F	p	Yes	No	t	p	Yes	No	t	p
Asthma crisis	2.66± 1.03	3.06± 0.83	3.42± 0.95	10.74	<.001 (a<b.c)	3.34± 0.87	3.10± 0.96	1.73	.084	3.18± 0.92	2.60± 1.26	1.91	.057
Allergic reaction	2.69± 1.08	2.97± 0.90	3.28± 1.00	6.13	.002 (a.b<c)	3.15± 0.96	3.04± 0.99	0.75	.450	3.08± 0.97	2.50± 1.18	1.85	.065
Diabetic crisis	3.03± 0.82	3.47± 0.79	3.61± 0.96	5.96	.003 (a<b.c)	3.61± 0.78	3.43± 0.91	1.43	.151	3.49± 0.86	2.90± 1.37	2.08	.038
Seizure	2.26± 1.07	2.61± 0.99	2.85± 1.14	4.50	.012 (a<b.c)	2.82± 1.08	2.62± 1.07	1.28	.199	2.69± 1.07	2.10± 1.20	1.70	.089
Cardiopulmonary failure	3.34± 1.11	3.57± 0.77	3.59± 1.06	0.98	.374	3.68± 0.81	3.51± 0.98	1.19	.232	3.58± 0.92	2.90± 1.29	2.23	.026
Bleeding/facture	3.17± 0.95	3.50± 0.75	3.54± 0.94	2.55	.080	3.56± 0.80	3.45± 0.88	0.93	.352	3.49± 0.84	3.00± 1.33	1.77	.077
Head/neck injury	2.89± 1.08	3.22± 0.78	3.35± 1.04	3.27	.039 (a<b.c)	3.39± 0.82	3.18± 0.98	1.49	.137	3.25± 0.93	2.60± 1.26	2.15	.032
Heat related illness	3.00± 1.06	3.42± 0.87	3.45± 1.11	2.92	.055	3.60± 0.88	3.32± 1.03	1.94	.053	3.40± 0.99	2.90± 1.45	1.53	.125
Poisoning	2.54± 0.95	3.12± 0.84	3.23± 0.99	7.70	.001 (a<b.c)	3.26± 0.89	3.05± 0.95	1.55	.121	3.11± 0.92	2.70± 1.42	1.35	.177
Choking	3.17± 1.10	3.52± 0.87	3.56± 1.06	2.17	.116	3.76± 0.92	3.42± 1.00	2.42	.016	3.52± 0.96	2.80± 1.48	2.27	.024

SD=standard deviation

#### IV. Discussion

Most schools had response plan to the health crises in general, but 46.7% to 58.4% of schools had the health crisis-specific plan. Equipment for the health crisis such as oxygen glucose monitoring device, automated external defibrillator, and cervical spine collar were available over 85% of the schools. However, bronchodilator delivery device, epinephrine auto-injector, and suction device showed limited availability. The self confidence in

responding to the health crises ranged from 2.67 (managing seizure) to 3.55 (performing CPR) on a 5-point scale, and was significantly different by working years at hospitals for some health crises.

Most schools had response plans to the health crises, which was higher than 71% in the US (Ugalde, et al., 2017), but only a few had a specific plan. Therefore, health crisis-specific response plans need to be developed. Though the connection system between schools and the EMS outside the school is key elements, only



72.6% of the school has included the topic in the response plan, indicating lower than 88% in the US (Drezner, Rao, Heistand, Bloomingdale, & Harmon, 2009). In addition, considering that only 2.9% of the schools had automatic connection systems, the connection system between school and EMS outside the school should be improved. As for manpower for responding to the health crises, this study showed about two thirds of the schools did not appoint school physicians who could help with emergency care. Korea School Health Act (MGL, 2019a) stipulates that physicians and pharmacists who support the healthcare of students, teachers, and staff can be placed at schools, but it is not mandatory. Therefore, the school nurses who physically presented in school are responsible for responding to the health crisis on site, and many of them feel anxious about responding them and making decisions regarding transferring the cases to a hospital (Lee & Lee, 2014). As the Office of Education has mandated the designation of a counsellor to support the task of managing school violence, the Office should encourage each school to designate physicians or pharmacists or establish a network among healthcare professionals.

For equipment preparation, more than 80% of the schools had sterile disposable gloves, splints/bandages, sterile dressings, and cervical spine fixtures in school, which is encouraging result as open wounds and fractures are the most common conditions among children who admitted to the pediatric emergency room due to accidents (Yun & Kang, 2009). However, only

33.6% had bronchodilator inhalers, and less than 10% had epinephrine injectors and suction devices, although the demand for prescription drugs has increased in Korea (KCDC, 2019; KNHIC, 2016) as the number of children with chronic diseases such as allergic reactions, TID and asthma has increased. These results were significantly lower than those in the US where 72% schools had bronchodilator inhalers and 61% had epinephrine (Ugalde, et al., 2017). This may be due to the different systems between the countries on the use of prescription drugs in schools. According to the guidelines of the NASN (2012, 2014), schools with nurses are permitted to reserve prescription drugs such as glucagon and epinephrine, and detailed instructions on the use of the drugs are given to the school nurse. The US guidance on epinephrine administration for school nurses describes the designation of the person administering epinephrine in allergic reactions, and the procedures on staff training for early detection of signs and symptoms, along with the purchase, maintenance and dispensation of epinephrine in detail (Tanner & Clarke, 2016). For example, the first witness confirms the symptoms, calls the school nurse, and reports to 911. The school nurse immediately specifies the amount of epinephrine that should be administered according to the student's weight, and if the symptoms continue or resume after 5-15 minutes, there are very specific and standardized instructions regarding epinephrine administration (Tanner & Clarke, 2016). However, according to Korea School Health Act, items such as cervical spine, splint, crutches,

and a portable oxygen machine are listed as the basic equipment in school, while items such as bronchodilator inhaler and epinephrine injector are not listed (MGL, 2019a). Moreover, under Korea Medical Service Act (article 33) school nurses are not permitted to administer prescription drugs anywhere other than hospitals (MGL, 2019b), and school nurses are employed in 80.4% of the schools in Korea, 64% in Gyeongnam province (Lee, 2018) and much lower in rural area. As a result, children with chronic illnesses who attend schools without school nurses are inevitably at risk. Recently, Korea School Health Act has been amended to allow school nurses to administer glucagon and epinephrine in school for diabetic crises and allergic reactions, respectively (MGL, 2019a). Therefore, following Korea School Health Act (MGL, 2019a), school nurses must be assigned to each school so that they can provide proper emergency care for children with chronic illnesses, and specific guidance on care directions and equipment lists for each health crisis are urgently needed.

The self-confidence in responding to the health crises ranged from 2.67 to 3.55 points out of 5 in each situation, and the proportion of low level of self-confidence (less than 4 points) ranged from 44.2% in cardiopulmonary failure to 76.6% in seizure. According to Ugalde et al. (2017), the proportion of low level of self-confidence was 71% for choking, 56% for head/neck injuries, and 51% for poisoning. As per the revision of Enforcement rule of Korea School Health Act (MGL, 2019a), all teachers and staff should receive more than 4 hours of

CPR and first-aid training for each school year, which may contribute to higher self-confidence in responding to cardiopulmonary failure and choking. Considering increase in asthma crisis and allergic reactions in Korea (KCDC, 2019) and serious adverse events due to inappropriate emergency measures, systematic training programs for school nurses for improving self-confidence in responding to the health crises are required.

Self-confidence in responding to the health crises differed according to work experience at hospitals, having a qualification on life support, and having response plans at school. Here, the work experience at hospitals should be considered more important than the other two variables because it relates to six health crisis. This result is consistent with those of previous studies that greater experience in emergency situations increased the confidence in responding to the health crises (Cho, Kim, & Chun, 2012; Stoodley, McKellar, Steen, & Fleet, 2020), and that longer duration of working at hospitals was associated with higher self-confidence (Uhm, Jun, & Park, 2012). Based on these results, we suggest three strategies to enroll school nurses with more experience of working at hospitals. First, define the nursing experience required at hospitals as a qualification for school nurses, which is a difficult issue to solve urgently because social discussion and agreement are needed. Second, strengthen the job training on responding to the health crises and reinforce the ability to perform it through repeated education. Using effective education such as simulation training

is recommended for improving performance skills because it is important to cultivate not only knowledge but also first-aid skills (Johannesson, Silén, Kvist, & Hult, 2013; Stoodley, McKellar, Steen, & Fleet, 2020). In addition, providing a well-designed program continually helps in maintaining knowledge and skills (Reveruzzi, Buckley, & Sheehan, 2015), so a systematic and integrated education and training program needs to be provided repeatedly. Third, apply a one-to-one mentoring program to school nurses who have less experience in providing medical services. The previous study has reported that job satisfaction of newly appointed teachers increased through senior teachers' mentoring (Ke, Kuo, & Hung, 2017; Park & Hong, 2018).

To our knowledge, this is the first study to identify preparation and self-confidence of school nurses to respond to emergent, acute or life-threatening health crises in elementary, middle, and high schools and to suggest some recommendations in South Korea. We have especially tried to improve the validity of the response by describing the situations that can be faced in the real world, in the form of scenarios. However, there are some limitations. First, though we tried to increase the generalizability by recruiting participants from various schools (elementary, middle, and high schools), locations (urban or rural), and types of schools (private or public), this study still has a limitation in generalizability because all participants were from Gyeongnam province. Considering that the equipment in schools depends on the Office of Education's guidance

of each province (MGL, 2019a), further studies to compare the results with school nurses in other provinces or other countries are recommended. Second, self-confidence was collected through a self-report method, therefore, it may have been overestimated.

An increase in the incidence of the emergent and life-threatening health crises related to injuries and chronic illness has become a major health issue in school. Therefore, school nurses should urge the government or agencies to strengthen the administrative and equipment preparation such as building connection system between schools and the EMS outside the school, increasing placement of school nurses, expanding the basic equipment list, and developing specific guidelines on emergency medication administration. In addition, school nurses should assess their confidence in responding to the health crisis using the questionnaire and should actively participate in the training programs. Increasing the preparation and self-confidence of school nurses will promote school health and safety more effectively.

## V. Conclusion

Most schools have established general response plans to the health crises, but only a few have response plans specific to the health crisis. Equipment for responding to health crises in school was limited to those including cervical protector, splint, crutches, and portable oxygen machine. However, a few schools had

epinephrine auto-injectors and suction devices to respond to allergic reactions and seizures, respectively. The self-confidence of the school nurses in responding to the health crises was unsatisfactory and much lower if they lacked experience of working at hospitals or had no response plan in place at school. Therefore, for the capacity building of school nurses to respond to emergent, acute or life-threatening health crises, health crisis-specific response plan, specific guidance on care directions and equipment and systematic training using simulation, and mentoring programs are recommended.

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