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School safety and children health in a post-disaster community: Implications to collaborative care and service learning in school health

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ABSTRACT

Objectives: To explore the impact of the Lushan earthquake on the schoolchildren's health and learning environment after 2 months of the earthquake and to collect children health information and identify school environmental health risks.

Methods: This was an explorative single-case study. The case was defined as the two primary schools affected by the earthquake on 20th April, 2013 and relocated in a rebuilt temporary classroom. This study collaborated with Department of Social Work, Sichuan Agricultural University located in Ya'an. With the support from the above social work station, 448 school-age children from the affected Majun and Gonghe primary schools were invited to participate in this study from July 1 to 2, 2013. Finally, 187 children participated. Data were collected through structured questionnaire, field observation and the social work station's report and analyzed by using descriptive analysis and qualitative content analysis.

Results: One hundred and eighty-seven school-age children participated in this study. Participants' demographic characteristics showed that around half of the subjects (89; 47.6%) were male. Majority were aged 10 or above (114; 61%) and in grades 4–6 (108; 57.7%), whereas only 7% (13) were preschool children. Near three quarters (134.0; 71.7%) children were not living with their parents. School environmental health risks were identified including public health and school building risks.

Conclusions: One hundred and eighty-seven school-age children in two primary schools were involved in this study. Baseline data for children's health status were obtained and the school health risks were identified. The findings suggested that it would be vital to develop collaborative care and service learning model to enhance children health and school safety in a disaster-prone community.

1. Introduction

On May 12, 2008, a massive earthquake hit Wenchuan and killed 87476 people^[1]. At least 5335 schoolchildren and adolescents were killed and 546 students suffered injuries that resulted in various degrees of disability^[2]. Compared to adult survivors and rescue/recovery workers, children are particularly vulnerable because of their physical and psychosocial vulnerabilities in natural disasters^[3–6]. In addition, disasters like earthquakes do not only damage educational

infrastructures and buildings, but also disturb children's regular educational activities, especially for those living in rural areas^[7]. Disaster risk reduction measures can create safer school buildings and safer learning environments that will help to prevent mortality and morbidity; these measures can also promote optimal health for schoolchildren^[8]. However, in the wake of the devastation caused by the earthquake that struck Lushan County on April 20, 2013, little is known about the disaster's full impact on children's health and the school environment in Sichuan Province of China.

The aim of this study was to explore the impact of the Lushan earthquake on the schoolchildren's health and learning environment after two months of the disaster struck, and to collect children's health information and identify school-related environmental health risks.

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2. Materials and methods

This was an exploratory case study focused on the two primary schools that were affected by the 2013 Lushan earthquake and relocated in temporary classrooms. This study collaborated with the Department of Social Work from Sichuan Agricultural University located in Ya'an. With the support from the above social work station, a total of 448 schoolchildren from the affected two primary schools were invited to participate in this study from July 1 to 2, 2013. A total of 187 children (89 male, 98 female) finally participated in the study. Structured questionnaires, field observations and the social work station's report were used to collect the data in this study.

Descriptive analysis and qualitative content analysis were used to analyze the data. Approval for this research study was obtained from the Human Ethics Committee of the Hong Kong Polytechnic University. Written or verbal consent was obtained from the schoolchildren's parent(s) or grandparent(s) before delivery of the questionnaire.

3. Results

A total of 187 children (89 male, 98 female) participated in this program. The participants' demographic characteristics were presented in Table 1. The majority of participants were primary school students aged 10 or above (114; 61.0%) and in grades 4–6 (108; 57.7%), whereas 7% (13) were preschool children. Nearly three-quarter (134; 71.7%) children were not living with their parents.

Table 1

Participants' characteristics and health status.

Characteristics		<i>n</i>	%
		(total = 187)	
Demographic factors	Gender	Male	89 47.6
		Female	98 52.4
	Age	< 10	73 39.0
		≥ 10	114 61.0
	Education level	Pre-school	13 7.0
		Primary 1–3	66 35.5
Primary 4–6		108 57.7	
Living status	Living with parents	53 28.3	
	Not living with parents	134 71.7	
Healthcare service utilization	Doctor	Yes	153 81.8
		No	34 18.2
	Dentist	Yes	29 15.5
		No	158 84.5
Ophthalmologist	Yes	9 4.8	
	No	178 95.2	
BMI level (kg/m ²)	Underweight	< 18.5	48 23.1
	Normal	18.50–24.99	124 66.3
	Overweight	> 25	9 4.8
	Obese	> 30	5 2.7
	Missing	< 18.5	1 0.5
BP level	Normal (SBP)	< 90th percentile	176 94.1
	High (SBP)	≥ 90th percentile	11 5.9
	Normal (DBP)	< 90th percentile	185 98.9
	High (DBP)	≥ 90th percentile	2 1.1
Mental health status*	Normal	179 95.7	
	Perceived mild and severe distress	8 4.3	

*: Mental health status was measured by general health questionnaire. BMI: Body mass index; BP: Blood pressure; SBP: Systolic blood pressure; DBP: Diastolic blood pressure.

The majority of children (153; 81.8%) visited a doctor before the study. The dental service was performed in twenty-nine children (15.5%) while the optometry service was performed in nine children (4.8%). In terms of BMI levels, the majority of children were measured in normal ranges (124; 66.3%) and approximately a quarter (23.1%) of them were underweight. Almost all of them (185; 98.9%) had normal DBP and 94.1% had normal SBP. Nearly all (179; 95.7%) of the children's mental health status was within the normal range. Eight students were suspected with mild and severe stress levels (8; 4.3%) measured by general health questionnaire.

3.1. Participants' eating habits

Table 2 shows that nearly a quarter of the children (42; 22.6%) only ate breakfast 2 times or fewer per week. The main reported reason was low/no appetite (33; 75.0%) followed by insufficient time (13; 30.2%).

Table 2

Participants' eating habits.

Eating habits	<i>n</i>	%
How often do you eat breakfast (<i>n</i> = 186)	Never	16 8.6
	1–2 times a week	26 14.0
	3–4 times a week	47 25.3
	5 times or more a week	97 52.2
Reasons for not having breakfast (<i>n</i> = 43)	Insufficient time (<i>n</i> = 43)	13 ^a 30.2
	Get up late (<i>n</i> = 41)	9 ^a 22.0
	No time to prepare it (<i>n</i> = 41)	6 ^a 14.6
	Nobody prepares it at home (<i>n</i> = 39)	0 ^a 0.0
	Not hungry/No appetite (<i>n</i> = 44)	33 ^a 75.0

Numbers in the brackets represent the number of subjects replied the question.

^a: The number of subjects who replied "Yes" among the total subjects for each reason for not having breakfast.

3.2. Identification of school environmental health risks

According to the information obtained from the investigator's observation as well as the documentation and a brief report made by local social workers, the nature of the Lushan earthquake and its impact on two primary school buildings and infrastructures was described as: the earthquake registering 7.0 on the Richter scale occurred at 08:02 Beijing time on April 20, 2013 in Lushan County, Sichuan Province. The casualties included 196 dead, 21 reported missing, and 14000 injured, and more than 1200 households and 4500 people affected. Seven major villages in Shangli Town, Rain City District were affected by this earthquake. They included Gonghe, Temple Xia, Qijia, Zhi-an and Sijia, Wujia, and Liujia. Majun and Gonghe Primary School served for this local community. Both schools included seven grades (from pre-school to Grade 6). Because the earthquake occurred outside of school hours, no children were injured or killed during the earthquake. However, 14 adult residents in the villages were injured, and of those, 4 were severely injured and sent to the hospital during the incident. There were 208 students in Majun Primary School, and 240 in Gonghe Primary School. The actual risks were presented in Figures 1–10.

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