

ORIGINAL ARTICLE

Preparing community health leaders to safely transfer vulnerable flood victims

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Abstract

Aim: There are increasing numbers of vulnerable flood victims in Thailand, particularly those who require physical assistance with being transferred to safe community programs; however, training programs in safe handling techniques remain scarce. This Thai research intervention study is part of the development aimed at preparing community health leaders (CHLs) to transfer vulnerable groups of flood victims to safer areas during disasters.

Methods: CHLs representing nine flooding areas of the Hat Yai Municipality (n = 37) participated in this study. All had taken part previously in an urban community development project. The safe patient transfer training course was developed by nurses and the outcome measures included: (1) knowledge about patient transfers; (2) skills in lifting and transferring; (3) the use of observation records; and (4) measuring ergonomic lifting techniques. Quantitative data were analyzed using descriptive statistics.

Results: The results demonstrate that CHLs' knowledge about safely transferring vulnerable groups of flood victims increased at the end of the program, compared to what it was in the beginning ($p < .01$). In addition, compared to scores before the intervention, CHLs significantly increased their skills in safe ergonomic lifting techniques ($p < .01$).

Conclusion: Nurses can take an active role in improving their skills and the skills of community health workers in order to ensure safety for both vulnerable flood victims and volunteer groups when facing natural disasters.

Key words: community disaster preparedness, safe patient transfer, vulnerable flood victims

INTRODUCTION

Flood is the most common natural disaster in Thailand, especially in the southern region where there is a high risk for flooding every rainy season. Heavy rains, narrow canals, obstructed water flow, increased urbanization and the unique geographical location of Hat Yai Municipality in a lowland area cause it to be particularly vulnerable.

Moreover, Hat Yai Municipality is the heart of the economic area in southern Thailand; for that reason, the consequences of severe flooding are especially important. For example, the most severe flooding in Hat Yai Municipality occurred in 2000 and 2010, when people in every sector were affected by the disasters, despite the fact that the government had previously spent a large amount of money during the recovery phase. As a consequence, all organizations continue to work and cooperate in disaster preparedness for proper management.

In order to reduce the impact of future floods, public health management has refocused from “recovery” to “preparedness”. A government office has created a flood

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management model and recommends that Thai communities develop more effective response strategies for the future (Research & Development Office, 2011). Lessons learned from the 2010 flooding in Hat Yai have been focused on a flood management plan for the Hat Yai community. It includes most of the population, with the exception of two vulnerable groups who have remained less prepared for disaster; these groups are those with mobility impairments and those who require electronic devices such as suction and ventilator devices (Rodklai, 2015). Suriyawongpaisarn (2012) found that evacuation and transfer methods for these groups must be included in the community flood management plan. Helpers for these groups are the focus of this study.

Safe patient transfer is essential in emergency situations, including disasters. As part of disaster preparedness, comprehensive knowledge, abilities and actions are needed to prepare for and respond to threats. There are various groups of volunteers that help in disasters, with the most important volunteers being the community health volunteers (CHVs) living in communities. These volunteers are village members who are registered as CHVs and worked with community nurses. They are expected to be active team members in disaster situations. A previous survey found CHVs were inadequately prepared for disasters, and concluded that CHVs should be familiar with basic care ability in first aid. They needed knowledge and skills in proper and safe patient transfer procedures (Songwathana, Sae-Sia, Kitrungrrote, & Kongkamol, 2016). Those active team members were therefore chosen by their groups as community health leaders (CHLs) to be trained to carry out safe patient transfer.

Important rules for safe patient transfer procedures are not only to maintain patient safety, but also to protect volunteers who handle the transfers (Techasatian, 2007). Back pain syndrome, for example, frequently occurs when transfers are made without proper precautions (Mehta, Lavender, Jagacinski, & Sommerich, 2015). Correct and safe patient transfer positions are required as push power from the femur or humerus because those two bones are very strong (Kruesathit, 2005; Kunapraep, 2013). To protect the spine, push power from the latissimus dorsi must be avoided because it is a small bundle of muscles in which pushing can lead to danger. The correct push-up position to safely transfer objects or people involves three positioning procedures (Li & Zhang, 2009; Starker, 2003). First is the squat lift position, which is specific for carrying an object off the floor and requires the strongest leg power. Second is the stoop lifting position for bending down to carry an object

by using power from the latissimus dorsi muscle. The correct position in stoop lifting should involve a postural index of less-than .38. The third position for proper transfer is the grip position, which is a pushing position using arm power.

Various factors, including patient's ability, location and medical equipment, are associated with patient safety during transfer. Before the transfer, the volunteer needs to assess and collect patient details. During transfer, volunteers have a responsibility to observe patient's signs and symptoms (Inkaew & Chompunud, 2014; Iserson, 2016). According to safety protocol, a patient is required to be restrained before moving and transferring (Fitzpatrick, 2014), particularly for those who have a history of spinal cord injury and require a spinal board or cervical collar (Iserson, 2016).

As a result of cooperating with Hat Yai after the 2010 flood, the need for disaster preparedness education and training came to the attention of the Faculty of Nursing, Prince of Songkla University. A meeting about the needs of CHVs in providing care for flood victims was held (Songwathana *et al.*, 2016). Several topics were of interest to CHVs, including wound dressing, correct and safe transfer methods, calling for assistance and first aid. In particular, a rapid survey of focus groups among CHVs and healthcare providers showed that CHVs had little knowledge of transferring patients during floods. None of them were concerned about back pain or their own safety (Songwathana *et al.*, 2016). These gaps in knowledge may result in low levels of safety awareness. In addition, communities must address the need for guidelines when transferring victims who are highly dependent and require the use of medical equipment (Kongkamol, Songwathana, & Koonchumchoo, 2014). Therefore, the aim of this study was to provide knowledge and skills to CHLs regarding the transfer of vulnerable flood victim groups.

METHODS

Design and participants

The pre and post test, one-group design was conducted over 3 months, from October through December 2016. The researchers purposively selected a sample of 37 CHLs who resided in the community of Yai city, Songkhla, Southern Thailand, an area frequently affected by flooding. The researchers were introduced to the participants through community nurses closely working with them.

The training program for CHLs in this study was developed based on a previous study (Songwathana,

Sae-Sia, Kitrungrrote, & Kongkamol, 2016). The current course used booklets, VDO presentations, leaflets, lectures and demonstrations. The concise content and appropriate pictures, as well as the safe, correct transfer of patient technique using a video presentation in the training course, was validated by three experts in health emergency and disaster nursing.

The following instruments were used to evaluate the training program: (1) the Demographic Data Questionnaire; (2) the Knowledge Regarding Transferring Vulnerable people during Disaster Questionnaire; and (3) the Skills Regarding Transferring Vulnerable people during Disaster Questionnaire. The knowledge questionnaire items were developed based on a literature review. The questionnaire was composed of three components: assessment of patient readiness for transfer, patient illness and transfer methods. Higher scores meant higher knowledge. Regarding patient transfer skills, 12 items were evaluated, with 1 point granted for “correct” and 0 points were granted for “incorrect” answers. The ergonomic lifting position was also measured at the trunk by using standard procedures. A video recording of patient transfer before and after transferring, based on the flood survivor guideline was taken. The angle from the greater trochanter to the acromion process was measured via the kinovea program to identify the degree of the lifting position (Chaffin, Anderson, & Martin, 2009), which was measured three times; then an average was taken. For interpretation, the average degree of lifting position was compared before and after transfer had taken place, with further assessment of flood victims’ guidelines thereafter. A narrow angle was interpreted as a correct position (Chaffin et al., 2009). In addition to measuring the ergonomic lifting position, the question of “any feeling of back pain?” was asked. The instrument was checked for validity by three experts in disaster medicine at an emergency nursing faculty and a hospital. A KR-21 on knowledge and skills was carried out and was found to be above 0.7.

Data collection

Community health leaders came from eight hospital primary care units (PCU) in Hat Yai municipal, Songkhla, Thailand. Participants were invited to attend a 1-day workshop on the topic of safe patient transfer during a flood. The participants’ knowledge and skills were assessed twice (pre- and post-test). Two back demonstrations were observed and scored as participants demonstrated lifts and transfers with and without a simulated patient. The ergonomic lifting position was also recorded to confirm the correct position.

Ethical considerations

Ethical approval was obtained from the Ethical Committee of Hat Yai Municipality (SK52110/23). When participants were recruited and provided informed consent to participate in the study, they were informed about the risks and benefits related to participation.

Data analysis

Knowledge and skills regarding safe patient transfer were assessed before and after attending a training course. Scores were analyzed using descriptive statistics. Frequency, mean and standard deviation were calculated and statistically compared using a paired t-test.

RESULTS

Demographic data

The majority of participants were female (94.59%). More than half of the participants were aged between 50 and 60 years (56.76%) and married (64.86%). The majority of the participants (81.08%) had primary school educational backgrounds. Nearly half of these had earned income from their own businesses (43.24%), and approximately half of these (51.35%) had 11–20 years of experience working in community leadership positions (51.35%). Most had direct experience in flood disasters (75.68%).

Knowledge and skills

Table 1 shows that the participants’ knowledge increased for every item after attending the safe patient transfer training course. Knowledge was most improved in the following three areas: (1) assessment of the vulnerable people’s needs in order to prioritize who should be transferred first when flooding occurs; (2) assessment of the information regarding vulnerable people’s illnesses in preparation for the transfer; and (3) assessment of the environment, including the patient’s bed, and mapping vulnerable people’s houses for exit doors. The results demonstrate a significantly higher average score for participants upon completion of the safe transfer training course ($M = 9.57$, $SD = .83$) than pre-test scores ($M = 7.95$, $SD = 1.66$) ($p = .000$).

After attending the safe patient transfer training course, the overall score for skills in safe patient transfer after attending the course was 6.54 ($SD = 1.83$). The participants demonstrated correct skills for a safe patient transfer, as shown in Table 2. Moreover, items where all participants responded correctly to the questions were: (1) moving patients as close to the bedside as possible; (2) supporting patients when patients changed position from lying down to sitting down; (3) during transfers, the

Table 1 Participants’ knowledge of safe patient transfer in each item (N=37)

Knowledge	Pre-test		Post-test	
	<i>n</i>	%	<i>n</i>	%
1. Assess vulnerable people’s needs in order to prioritize who should be transferred when floods occur	29	78.4	37	100
2. Assess the information regarding vulnerable people’s illnesses to better prepare materials	31	83.8	37	100
3. Assess the environments surrounding patients’ beds and map vulnerable people’s houses for exit doors	34	91.9	37	100
4. Assess patients’ condition and medical equipment required for patients such as NG tubes, Foley catheters, suction and transferring aid equipment	35	94.6	37	100
5. Keep face-to-face contact with vulnerable people and keep them informed about directions when moving or transferring.	37	100	37	100
6. Lock wheels of transferring beds or wheelchairs before moving vulnerable people	35	94.6	35	94.6
7. Place patients’ hands on her/his chest or use restraints to safely move disabled people	36	97.3	36	97.3
8. Arrange patients in a comfortable position during transfer	36	97.3	36	97.3
9. Set patients’ beds in a flat position before transfer	37	100	37	100
10. Keep a spine stretch when moving a patient who has a heavy weight	36	97.3	36	97.3

transferor kept their back straight; and (4) transferors observed patient signs and symptoms during moving. Similarly, the score for transferring vulnerable people from a wheelchair to a bed was also high, particularly for transferors keeping their backs straight and observing patient signs and symptoms when moving. For each of these, almost all participants responded correctly. The mean rank of CHL positioning degree at the transferor’s trunk decreased significantly after attending the training course ($p < .001$; Table 3). None of the respondents complained of feeling back pain after lifting when asked.

DISCUSSION

Similar to this study, research in Indonesia found that more than 60% of CHVs lacked knowledge related to victim assessment and evacuation. Therefore, more knowledge and skills related to emergency care during disaster are needed (Kamal, Songwathana, & Sae-Sia,

Table 2 Participants’ skills of safe patient transfer in each item (N = 37)

Item/Skill	<i>n</i>	%
<u>From bed to stretcher</u>		
1. Moving patients to as close to the bedside as possible	37	100
2. Supporting patients when patients change position from lying down to sitting down	37	100
3. The first transferor stands up in front of patients then squats and fits the patient’s ankle joints	3	8.1
4. The second transferor stands up at the behind the patient then holds the patient’s arms against their chest. The transferor inserts their hands under the patient’s axilla and positions the patient’s arm	3	8.1
5. Signal readiness to move and keep in the direction and step of moving	5	13.5
6. Transferors keep their back straight during the patient transfer	37	100
7. Both the transferor and patient move together at the same time and in the same direction	5	13.5
8. Transferors observe patients’ signs and symptoms during transfer	37	100
<u>From wheelchair to bed</u>		
9. Place wheelchairs near the bedside, lock the wheels and fold the footboard out	4	12.1
10. During transferring, transferor keeps their back straight	33	89.2
11. Both the transferor and patient move together at the same time and in the same direction	6	16.2
12. Transferor observes patients’ signs and symptoms when moving	35	94.6

Table 3 Comparison of pre- and post-positioning degree of the transferors’ trunk (N = 37)

Positioning degree of the transferor’s trunk	<i>Mdn (IQR)</i>	Mean rank	<i>Z</i>	<i>p</i> value
Pre	44.00 (10.00)	20.37 ^a	-2.99	<.001
Post	36.00 (13.50)	15.30 ^b		

2012). Other findings also indicated that the CHLs could benefit from attending the safe transfer training course vulnerable groups of people (Annunta & Tonganake, 2012; Songwathana, Sae-Sia, Kitrungrrote, & Kongkamol, 2016).

Results of the current study suggest that most CHLs in Hat Yai Municipality gained adequate knowledge and skills, achieving more than the cut-off point level of 80% accuracy. CHL knowledge scores after the training course increased significantly, particularly regarding items

related to assessment of vulnerable people's needs, previous or current illness, and surrounding equipment and home environment, which indicated that they were prepared in terms of safety when it came to patient transfer. Patient assessment before and during transfer by community members should therefore be recommended in formal or informal training courses.

The results in this study can be explained by Bloom's Taxonomy of Learning Theory, which includes six learning methods: remembering, understanding, applying, analyzing, evaluating and creating (Bouchard, 2011; Paleeri, 2015). In addition, positive results may be a result of different techniques used in this training course compared with those used previously. The concise content and appropriate pictures likely helped the participant gain better understanding of safe and appropriate patient transfer methods. Moreover, the transferring patient technique using a video presentation in the training course was also likely to increase learners' attention, interest and imagination (Chaijaroen, 2014). The safe transfer training course for CHLs also resulted in a significant decrease in the positioning degree of transferors' trunks ($p = .001$), which ensures workers' own safety when transferring. Furthermore, components in training programs have been supplemented with basic first aid skills and an introduction to emergency preparedness, which also allowed for personal and family preparedness (Matthews & Sprague, 2005). Hence, efforts to prepare volunteers in disaster relief by offering a structured training program as an opportunity to build their capacity are helpful (Jacquet, Obi, Chang, & Bayram, 2014).

The outcomes of this study indicate that disaster-related patient transfer training is beneficial in improving the knowledge and skills of CHLs. Several additional advantages became apparent during this project. One was an increase in community capacity for responding to disasters, particularly in the number of CHLs who attended the training course. In addition, the CHLs reported that they had gained confidence for safe transfer with a correct position that is less likely to produce a backache during transfer. Lastly, community people in Hat Yai Municipality are alert to disaster preparedness partly because they experience the consequences of flooding so often. Consequently, they appreciate the value of, and want to have, good participation in disaster preparedness.

CONCLUSION

Disaster management at the global and local levels has

received more attention in the fields of nursing, medicine and health since the massive flooding in Hat Yai and the 2004 Tsunami in Thailand. Since these events, efforts in training and educating community volunteers and professionals in preparing for and managing disasters have been emphasized throughout Thailand. This study demonstrated that CHLs' knowledge and skills regarding safe patient transfer could be significantly increased through a relatively short education and training program. In addition, it also showed that the use of workshops and manual guidelines are appropriate in the Hat Yai Municipality.

LIMITATIONS OF THE STUDY

This study used a single group, quasi-experimental research technique with a pre-and post-test design. Therefore, confounding variable control was limited. Data were collected by using a scenario that merely reflected the current situation and might not have reflected direct experiences or action taken as a result of the flood. Regarding back pain assessment among CHLs, this was limited because of such a short time period, and none of the participants were concerned about back pain prior to training.

RECOMMENDATIONS

1. Most disaster management plans have given little attention to vulnerable groups who are unable to help themselves. Community health workers have the responsibility for disaster health management, which includes taking care of their most vulnerable groups, such as those with mobility impairments and those who require electronic equipment such as ventilators. Thus, physical patient transfer training should be included in disaster training programs. The key concept in safe patient transfer is safety for both the vulnerable people and the transferors. As safe patient transfer content is integrated into flood victim manual guidelines, nurses can help with the development of these learning packages.

2. The pre- and post-test quasi-experimental design with a control group is required to reduce the confounding factors of this study. The alternative practice related to safe patient transfer using a stretcher should be included in future training courses.

AUTHOR CONTRIBUTIONS

P. S. and W. S. S. conceived and designed the study, with P. S. obtaining the research funding. All four authors

conducted the study to obtain data under the research grant from the National Research Institutes of Thailand. While P. S. and W. S. S. provided data analysis and interpreted the data, P. S. and J. D. drafted the article and all authors contributed substantially to its revision. P. S. takes responsibility for the paper as a whole.

DISCLOSURES

The authors declare no conflicts of interest.

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