

A First Aid Training Course for Primary Health Care Providers in Nagorno Karabagh: Assessing Knowledge Retention

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Abbreviations:

ARCS: Armenian Red Cross Society
AUA: American University of Armenia
CHSR: Center for Health Services Research and Development
FATC: first aid training course
HAP-Nagorno Karabagh: Humanitarian Assistance Project in Nagorno Karabagh
USAID: United States Agency for International Development

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Abstract

Introduction: Conflict in the South Caucasus' Nagorno Karabagh region has damaged health facilities and disrupted the delivery of services and supplies as well as led to depletion of human and fixed capital and weakened the *de facto* government's ability to provide training for health care providers.

Problem: In response to documented medical training deficits, the American University of Armenia organized a first aid training course (FATC) for primary health care providers within the scope of the USAID-funded Humanitarian Assistance Project in Nagorno Karabagh. This paper reports the follow-up assessments conducted to inform policy makers regarding FATC knowledge and skill retention and the potential need for periodic refresher training.

Methods: Follow-up assessments were conducted six months and 18 months following the FATC to assess the retention of knowledge, attitudes, and self-reported practices. Eighty-four providers participated in the first follow-up and 210 in the second. The assessment tool contained items addressing the use and quality of the first aid skills, trainee's evaluation of the course, and randomly selected test questions to assess knowledge retention.

Results: At both follow-up points, the participants' assessment of the course was positive. More than 85% of the trainees self-assessed their skills as "excellent" or "good" and noted that skills were frequently practiced. Scores of approximately 58% on knowledge tests at both the first and second follow-ups indicated no knowledge decay between the first and second survey waves, but substantial decline from the immediate post-test assessment in the classroom.

Conclusion: The trainees assessed the FATC as effective, and the skills covered as important and well utilized. Knowledge retention was modest, but stable. Refresher courses are necessary to reverse the decay of technical knowledge and to ensure proper application in the field.

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Introduction

Access to medical care for emergency conditions is crucial in all communities, especially rural areas.^{1,2} People in rural areas often use primary health care facilities for medical emergencies rather than for preventive care.³ However, health care facilities may differ significantly in their capacity to provide emergency services, which depends on the number of health care workers and their level of expertise and the presence of appropriate medications, supplies, and equipment.¹ These features may be lacking or absent in rural primary health centers in developing countries. Because of limited access to secondary and tertiary care facilities, health care providers in rural community health centers must be able to quickly recognize injuries and illnesses, appropriately assess their severity, and take immediate steps that maximize patient health outcomes.¹

A significant gap exists between the knowledge and skills that physicians acquire in medical schools and the expectations that they face in practice, especially in rural areas and developing countries.^{1,4} Experts recommend supplementing providers at community

health centers with emergency care skills in addition to teaching first aid basics to a substantial proportion of the community as a means of compensating for these deficiencies in care.¹

Challenges

Nagorno Karabagh is a fertile, mountainous region located in the northeastern part of the Armenian highlands.⁵ Part of pre-Soviet Armenia, it was annexed to Soviet Azerbaijan by Stalin in 1923. In 1988, its governing council requested to be free from the administration of Soviet Azerbaijan and included in Soviet Armenia.⁶ This request resulted in military conflict that lasted until 1994 when a cease-fire was enacted, with Armenians in control of most of Nagorno Karabagh as well as a small "security corridor" of Azeri land connecting Nagorno Karabagh to Armenia.

While not recognized as an independent state, Nagorno Karabagh's *de facto* government struggled to establish a functioning state.⁷ Conflict in the area resulted in thousands of deaths, over one million refugees and displaced persons, and a devastated economy.⁸ The absence of international recognition hinders international communications, trade, and the foreign assistance that other developing countries receive.⁷ The malfunctioning of the Nagorno Karabagh health system is attributed to the "inherited" deficiencies from the Soviet health care system,^{9,10} further aggravated by the difficult economic and political situation inherent in frozen conflict (a conflict "ending" in a stalemate but subject to heating up in the future).¹¹ The chronically underfunded Nagorno Karabagh health system is characterized by lack of community participation, lack of health promotion and disease prevention activities, inadequate infrastructure, insufficient supplies, and dysfunctional health information, communication, and transportation systems, coupled with workforce development issues such as the lack of health personnel, insufficient training and retraining of health personnel, and outdated protocols.¹¹⁻¹³ Consequently, many people either never seek health care, or seek care at late stages of illness, leading to declines in the health status of the population.¹¹⁻¹⁴

Another challenge facing the Nagorno Karabagh post-war health system is the depletion of human and fixed capital. In addition to destroying clinics, hospitals, laboratories, and health care centers, military conflicts may trigger the emigration of younger and better-trained medical professionals.¹⁵ Since post-war systems are rarely able to provide quality training opportunities for health care providers, they develop "information hunger."¹⁶ The health care workforce is vital to protecting and advancing health, and in situations where health authorities lack resources to control human capital and sustain regular training programs, temporary short-term training programs and refreshers may be the only available option.

Responding to the need for an integrated humanitarian support program, the United States Agency for International Development (USAID) in 2003 contracted the Fund for Armenian Relief and the American University of Armenia (AUA) to implement the Humanitarian Assistance Project in Nagorno Karabagh (HAP-Nagorno Karabagh). The Center for Health Services Research and Development (CHSR) at AUA implemented the health component of the program with a combined approach of infrastructure rehabilitation paired with targeted workforce development activities. The first phase of the project (2004) consisted of detailed health facility and health worker training needs assessments. The assessment relied on

in-depth interviews and focus group discussions supplemented with expert opinion and field observations.¹³ The prioritized training programs were built upon existing resources and capacity and included first aid, clinical integrated management of childhood illnesses, and adult disease management. The evaluation of one of the first priority training courses conducted in the scope of this program, the first aid training course (FATC) for primary health care workers organized by the Armenian Red Cross Society (ARCS) and AUA is the focus of this article.

The First Aid Training Course

The FATC began on March 5, 2006 and ended in June 2006. Overall, 300 providers from Askeran, Martuni, Shoushi, Hadrut, and Martakert regions of Nagorno Karabagh participated in the trainings. ARCS instructors conducted the immediate pre- and post-evaluation of the course¹⁷ as part of the certification assessment, using two types of tests: theoretical (written) and practical. In conformance with international standards, passing for each test was set at 70%. Over 98% of the trainees met or exceeded international standards and were awarded the Red Cross First Aid Certificate. Nearly half of those failing to certify were limited by their own poor health status. The mean written test score was 87.3% and the mean practical test score was 88.5%.

FATC instructors used ARCS international standards and requirements, with students completing the course issued an internationally recognized certification. The primary aim of the >40-hour FATC course was to prepare health personnel to reduce the vulnerability of the population to various kinds of emergencies and disasters. FATC learning objectives covered recognizing and caring for disorders of vital functions (airway, breathing, circulation); injuries; sudden illnesses; heat and cold exposures; poisonings; cardiopulmonary resuscitation; immediate disaster response; infectious disease control; prevention of disease transmission; and childbirth. Trainees were provided course manuals (including manuals addressing basic first aid, responding to emergencies, and first aid elements) and first aid kits that were provisioned proportionate to the size of the community the trainees served.

Methods

Limited resources precluded the fielding of a separate FATC assessment. Consequently, convenience sampling of all FATC trainees who returned for subsequent program training activities was used to implement two evaluation waves, one at six months post-FATC-training and one at 18 months. The brief surveys assessed knowledge retention, attitudes, and self-reported practices. In the first wave (November 2006), 84 providers completed survey questionnaires during their follow-on integrated management of childhood diseases training. In the second wave (November 2007), 210 providers completed the survey questionnaire during their follow-on adult disease management training.

The follow-up instrument included items assessing the use and quality of the first aid skills acquired, the trainee's evaluation of the FATC, and five randomly selected standard questions from the ARCS test, excluding items used on the FATC certification exam. The selected questions assessed whether the trainees were able to provide adequate first aid to a victim experiencing labored breathing, a fall victim with a protruding bone, a victim who ingested a poisonous substance, a victim

Statements About the Course	FU (mo.)	SA (%)	A (%)	N (%)	D (%)	SD (%)
I learned a great deal about first aid from this course	6	81.0	19.0	-	-	-
	18	71.9	28.1	-	-	-
The instructors were competent	6	84.1	13.4	2.4	-	-
	18	79.5	20.0	0.5	-	-
The course was interactive	6	86.6	13.4	-	-	-
	18	68.6	30.5	1.0	-	-
The instructors were interesting	6	91.6	8.4	-	-	-
	18	83.3	16.7	-	-	-
The classroom lectures were informative	6	75.6	23.2	1.2	-	-
	18	72.4	27.1	0.5	-	-
The practical lessons/hands on demonstrations were effective	6	86.6	13.4	-	-	-
	18	74.3	25.7	-	-	-
The course was mostly a refresher for me	6	68.7	27.7	2.4	1.2	-
	18	67.1	31.0	-	1.9	-
The course omitted important first aid information	6	7.4	4.9	2.5	50.6	34.6
	18	4.3	2.9	2.4	73.3	17.1
The course was valuable to me	6	68.7	31.3	-	-	-
	18	65.2	34.3	0.5	-	-
I gained confidence in my first aid skills from this course	6	68.7	28.9	1.2	-	1.2
	18	59.5	40.5	-	-	-

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Table 1. Agreement (%) with Aspects of the First Aid Training Course by Follow-up Interval

Abbreviations: FU, follow-up interval (months); SA, strongly agree; A, agree; N, neutral; D, disagree; SD, strongly disagree.

bleeding through a dressed wound, and a victim suffering a seizure. The same instrument was used for both waves.

The AUA/CHSR team entered the data from both waves into a data set using SPSS 11.0 software (SPSS, Inc., Chicago, Illinois, USA). The data set was cleaned through range checks, logic checks, and validating 5% of the entries. Chi-square test and *t* test for independent samples were used for the analysis.

Results

First Wave

Overall, 293 primary health care providers throughout Nagorno Karabagh were certified as first aid providers, of which 84 (28.7%) took part in the first follow-up survey. The respondents were primarily from the Askeran region (71.4%).

Consistent with the profile of FATC trainees, seven of the 84 (8.3%) respondents were physicians and 77 (91.6%) were mid-level health personnel (nurses or feldshers). The majority of the respondents were from small rural health posts (*n* = 54, 65.9%), with the remainder from village ambulatories (23.2%) and regional polyclinics (11.0%). The health providers typically served a community of fewer than 200 in 26 cases (31.0%), from

200-500 in 21 cases (25.0%), from 501-1,000 in 18 cases (21.4%), and more than 1,000 in 19 cases (22.6%). The majority of respondents were females (95.2%).

On average, the respondents recalled using their emergency first-aid skills 13.2 times during the prior six months, with answers ranging from zero to 200, varying with the size of the community they served and other factors. Over 33.3% self-reported that the quality/skill of their first aid practice was "excellent," while 54.8% reported it as "good" and 11.9% described it as "satisfactory." The majority of respondents agreed that the FATC training course was important and useful. Table 1 shows the percentage of agreement with different statements about the course. Of the five standard knowledge questions, respondents scored an average of 58.3% correct. Grading standards for the analysis were stringent, with partially correct answers being scored as incorrect.

Second Wave

Participants in the second follow-up survey were 210 primary health care providers (72% of the initial FATC trainees). The respondents reflected the professional training and geographic

Statements About the Course	FU (mo.)	SA (%)	A (%)	N (%)	D (%)	SD (%)
I regularly use my first aid skills with patients	6	54.3	45.7	1.0	-	-
	18	48.1	50.5	-	0.5	-
I feel the FATC has improved the quality of my practice	6	54.9	43.9	-	1.2	-
	18	50.5	49.0	0.5	-	-
I have the necessary medical supplies to apply my first aid training	6	27.8	43.0	5.1	22.8	1.3
	18	29.0	44.8	5.2	20.0	1.0
The FATC was not relevant to my scope of practice	6	6.3	16.5	3.8	49.4	24.1
	18	5.7	9.5	3.3	69.0	12.4
I value my First Aid Training Certificate	6	64.2	32.1	2.5	-	1.2
	18	66.7	32.9	0.5	-	-
My employer values my First Aid Training Certificate	6	50.6	45.7	3.7	-	-
	18	46.2	45.7	7.6	0.5	-
My patients value my First Aid Training Certificate	6	50.0	45.0	5.0	-	-
	18	51.0	47.1	1.9	-	-
The FATC covered the most important first aid situations I encounter in my practice	6	50.6	44.4	2.5	1.2	1.2
	18	46.2	53.3	0.5	-	-
I am confident that I correctly apply my First Aid training	6	50.0	48.8	1.2	-	-
	18	46.7	53.3	0.5	-	-
I would appreciate other continuing medical education training opportunities.	6	76.3	21.3	2.5	-	-
	18	66.7	33.3	-	-	-

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Table 2. Agreement (%) With the Effectiveness of the First Aid Training Course (FATC)

Abbreviations: FU, follow-up interval (months); SA, strongly agree; A, agree; N, neutral; D, disagree; SD, strongly disagree.

distribution of the initial FATC trainees. The results largely mirrored those seen at the initial follow-up. The majority of the respondents were from small rural health posts (61.4%). Approximately 30% worked in village ambulatories, 5.2% worked at regional polyclinics, and 3.8% worked in rural hospitals. Twenty-two percent of the providers served a community with more than 1,000 residents. Most of the respondents were females (96.7%) and non-physicians. Respondents recalled using their emergency first aid skills 13.2 times, exactly the same percentage as the first wave, with answers ranging from zero to 150. One-third (33.3%) considered the quality/skill of their practice as "excellent," 55.2% reported it as "good," and 11.4% described it as "satisfactory," and most reported a positive assessment of the FATC (Table 2).

On average, 58.0% of knowledge items were answered correctly, a result virtually identical to the first wave (Table 3) but approximately 19% lower than at the conclusion of the FATC (using a more expanded test instrument). Despite the aggregate similarity, an item level chi-square test of knowledge

items (Table 4) indicated that first wave respondents did better with the item related to someone with labored breathing than the second wave (82.1% vs. 76.2%), the item related to an open fracture (19.0% vs. 9.5%, $P < .05$), and the item related to epileptic seizures (83.3% vs. 71.9%, $P < .05$). Second-wave respondents did better for the remaining two items (ingested poison, bleeding through a dressing). The open fracture item consistently yielded the poorest response. Furthermore, the aggregate means significantly differed between physicians (77.0%) and nurses/feldshers (44.0%).

Discussion

Unfamiliar emergency situations which present new challenges can cause significant stress in health workers.¹⁸ Health care providers may have to respond to life-threatening emergencies only several times throughout their careers. Therefore, even well-experienced providers may need more training and practice to remain confident in such situations.¹⁹ Still, the public expects that providers should be sufficiently competent to provide first aid

Category	Knowledge Score (%)
Follow-up interval	
6 months (n = 84)	58.4
18 months (n = 210)	58.0
Professional background^a	
Physicians (n = 13)	77.0
Nurses and feldshers (n = 281)	57.2

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Table 3. Mean Aggregate Knowledge Score (%) by Follow-Up Interval and Professional Training

^aThe difference is statistically significant, $P < .05$.

First Aid Knowledge Items	6 months ^a	18 months ^b
Providing first aid to a victim with...	% Correct	% Correct
Labored breathing ^c	82.1	76.2
A bone protruding from skin ^c	19.0	9.5
An ingested poison	71.4	87.1
Blood seeping from a dressed wound	35.7	45.2
An epileptic seizure ^c	83.3	71.9

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Table 4. Responses to First Aid Knowledge Items (% Correct), by Follow-Up Interval

^aN = 84.

^bN = 210.

^cThe difference is statistically significant, $P < .05$.

in any setting or circumstance.¹⁹ In the context of Nagorno Karabagh, and especially its rural areas where a single nurse or midwife is often the only trained provider within an hour's drive,

a provider's first aid knowledge and skills can be critical to a patient's survival.

The first aid training course offered to Nagorno Karabagh primary care providers sought to address training gaps and refresh previously acquired emergency medicine knowledge and skills essential for their professional performance. The course was offered to providers in response to the training needs that they had expressed during needs assessment study conducted at the start of the assistance program.¹³ The analysis of the responses to knowledge items revealed substantial initial decay in providers' technical knowledge but that this decay appeared stable thereafter. The knowledge-retention rates observed in the study are comparable to rates noted by other researchers in the field.²⁰⁻²² The observed difference between physicians and nurses could be explained by physicians' better baseline knowledge and practice of emergency medicine. The number of reported instances where providers drew upon these first aid skills affirms the observation that first aid skills are crucial for rural communities in Nagorno Karabagh.

Conclusion

The management and support of human resources for health care can become a major problem in countries where funding and international aid are lacking. The FATC for primary health care providers in Nagorno Karabagh served as an important refresher and significant addition to their emergency medicine knowledge and skills. Such skills are especially important in remote and frozen conflict areas. The research findings suggest that, despite appreciable decrements in knowledge at six and 18 months, participants viewed the FATC as an important and effective training course. The difference in physician and nurse/feldsher knowledge retention and skill utilization suggest they should be trained separately in the future.

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Disclaimer

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