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The Impact of the *Geriatrics Education for EMS* Training Program in a Rural Community

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Abstract

The *Geriatrics Education for EMS (GEMS)* course provides continuing education for emergency medical service (EMS) providers. This study evaluates the impact of the course on EMS providers in a rural county by performing a prospective cohort study using a pre-/post- survey design. We used the Geriatric Attitude Scale, the *GEMS* knowledge post-test, a class satisfaction survey, and a survey evaluating EMS providers' comfort in caring for older adults to measure the classes' impact. Eighty-eight EMS providers participated. All passed the course and were very satisfied with the course. Follow up was completed on 77(80%). No significant change in attitude score was identified ($p=0.09$). Median comfort scores significantly increased for the following domains: communications, medical care, abuse evaluation, and falls evaluation. Providing the *GEMS* course to EMS providers in a rural community resulted in students achieving a pre-established level of knowledge regarding caring for older adults and an increase in their comfort level for the care of older adults. The impact of the training on patient outcomes needs to be identified.

Keywords

Emergency Medical Services; Education; Geriatrics

Introduction

Emergency medical services (EMS) providers such as emergency medical technicians (EMTs) and paramedics receive very little geriatrics specific education.^{1,2} The National Standard Curriculum for paramedic training includes some sections that focus on caring for older adults (age \geq 65), such as a section on physiology across the lifespan and a section on geriatrics. However, these comprise only a small proportion of the overall training.² Furthermore, the National Standard Curriculum for EMT training does not include any sections that specifically focus on the care of older adults.¹

This lack of training is a concern due to the large number of older adult patients cared for by EMS providers. A recent analysis of EMS use in the United States found that between 1997

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and 2000, older adults comprised 38% of the EMS transports to an ED. Older adults used EMS at a rate of 167 uses/ 1000 population, a rate four times greater than younger adults.³ It is estimated that by 2030, older adults will comprise approximately one-half of EMS transports.⁴

In response to this educational deficiency, the American Geriatrics Society and the National Council of State EMS Training Coordinators, along with leaders from a number of medical organizations, developed a continuing education course for EMS providers: *Geriatrics Education for Emergency Medical Services (GEMS)*.⁵ Although released in January 2003, to our knowledge the impact of the training has never been evaluated.

The aim of this study was to evaluate the impact of the *GEMS* course on EMS providers. We hypothesized that the course would: 1) provide a minimum level of knowledge and skills in the care of older adults to EMS providers; 2) improve older adult-friendly attitudes among EMS providers; and 3) improve the comfort of EMS providers in caring for older adults.

Methods

Setting

The study evaluated a geriatrics continuing education program provided to EMS providers in Livingston County, New York between October 2005 and February 2007.

Livingston County is a rural county in Upstate New York that covers 640 square miles. The Census Bureau estimates that Livingston County had 64,173 residents in 2006 and estimates that 12.1% (7,765) were aged 65 and older.

Livingston County includes 12 transporting EMS agencies. The agencies responded to 7,802 emergencies in 2006, with the volume of the individual agencies ranging from 223 to 1468. Four of the agencies provide care at the advanced life support level using primarily paramedics. The remaining eight transporting agencies provide care at the basic life support level using EMTs. All of these EMS agencies were staffed with volunteers. In addition to the twelve transporting EMS agencies, the Livingston County Government operates a non-transporting advanced life support agency that supports the 12 transporting volunteer EMS agencies. In 2006, the County-run service responded to 2,489 of the total calls in Livingston County along with the volunteer agencies.

It is estimated that approximately 200 active EMS providers practice in Livingston County. However, the vast majority of these providers do not consider EMS to be their primary occupation and only participate on a volunteer basis.

Study Participants

The study was offered to all enrolled in the *GEMS* courses provided throughout Livingston County. Participants had to be age 19 and older, active EMS providers at any the EMT level or above (advanced life support or basic life support), and members of at least one EMS agency in the County.

Education Program

The *GEMS* course is a continuing education curriculum published by Jones and Bartlett Publishers in conjunction with the American Geriatrics Society and the National Council of State Emergency Medical Services Training Coordinators.⁵ Two versions are available, a one-day course for basic life support providers and a 1.5-day course for advanced life support providers.

For this program, we chose to teach all EMS providers the one-day basic life support course. This decision was made because 1) we estimated that 80% of students would be at the basic life support level; and 2) preliminary surveys of EMS providers determined that very few would participate in a course lasting more than one day. The grant funded course was free of charge to participants and was offered as part of a larger older adult injury and illness prevention program.

A core group of eight instructors were trained to teach the *GEMS* BLS course and participated in teaching the course throughout the county. A total of nine courses were held. The principal investigator participated in eight of the nine courses to ensure consistency in the program. We chose to offer a large number of courses to maximize the convenience for the EMS providers.

The course followed the *GEMS* requirements, including teacher-student ratios. The course followed the recommended *GEMS* BLS Course Schedule, with the following topics being covered during each course: 1) Aging; 2) Changes with Age; 3) Communicating with Older People and Their Caregivers; 4) Elder Abuse and Neglect; 5) End of Life Care Issues; 6) Assessment of the Older Patient and Pharmacology; 7) Trauma, Musculoskeletal Disorders, and Falls; 8) Respiratory and Cardiovascular Emergencies; and 9) Neurological Emergencies and Altered Mental Status.⁶ Additionally, we included the optional module on depression. The time spent on the individual topics sometimes varied from the suggested schedule provided by the publisher based upon the needs of the individual classes and students.

At the end of the course, we administered the Jones and Bartlett provided post-test to assess the learning. Participants who passed the post-test received a certificate (card) to indicate successful completion of the course.

Study Design and Measures

This prospective cohort study of EMS providers taking a *GEMS* course was part of a broader, County-wide program of using EMS providers to identify older adults with unmet medical and social needs. We used a pre-/post- survey evaluation instrument to evaluate the impact of the course. The University of Rochester Institutional Review Board approved this study.

Prior to the start of instruction, eligible students were approached to participate in the study. Those consenting to participate completed three sets of surveys: 1) a demographic survey; 2) the UCLA Geriatric Attitudes Scale^{7,9}; and 3) a care comfort survey. The attitude and comfort surveys are shown in Figure 1. The demographic survey was developed by the study team in an iterative fashion, using pilot testing within the project team and with selected other available EMS and research staff not involved with the study to ensure that the proper domains were being queried. The care comfort survey was developed in a similar fashion, with the questions addressing major domains of EMS care for older adults. The internal consistency of the care comfort survey was measured by Cronbach's alpha and found to be 0.87, showing good reliability. The UCLA Attitudes Scale was used because it has been previously validated.^{7,8}

After taking the class, students first completed the post-test required as part of the *GEMS* course. This multiple-choice test provided by the publisher has 20 questions and each student must answer 80% correctly to pass the class. Participants also completed a satisfaction survey to evaluate the course content and instruction. The study team felt a satisfaction survey was important as dissatisfaction with the course content or instructional methods may prevent students from learning and implementing the skills taught.

Three months after the course was completed, all students were contacted via phone and the UCLA Geriatric Attitudes Scale and the comfort surveys were repeated to determine the interval change in comfort and attitudes.

Data Management and Analysis

All data recorded from the surveys and telephone follow up were entered into a Microsoft Access database (Microsoft Corp., Redmond, Washington). Data were then transferred to Stata 8.0 (Stata Corp, College Station, Texas) for analysis.

Power analysis was performed prior to starting the study. Based on results from Reuben and a desire for a 10% improvement in the attitude score, we determined that a sample size of 58 would be required.

Standard descriptive statistics were used to characterize the participating EMS providers and to characterize their evaluations of the *GEMS* class. The initial analysis plan included using the t-test to compare continuous data. However, it was identified that some of the data were skewed. As a result, medians were also used to compare continuous data due to the non-parametric nature of these data. Attitude survey scores from before the class and from the three month follow up were averaged and analyzed using the paired t-test.⁹ Comfort survey questions were individually compared using the Wilcoxon signed-rank test. A $p < 0.05$ was used for statistical significance.

Results

Eighty-eight subjects enrolled in the *GEMS* course and participated in this study. Table 1 describes the demographics of the students. The majority of students were at the basic life support level and the majority cared for relatively small numbers (<5) of patients per week. This was not surprising given the rural nature of Livingston County and the predominance of BLS care in Livingston County.

All 88 (100%) subjects who took the *GEMS* class successfully completed the post-test. Thus, they were considered to have successfully completed the course. Table 2 shows the results from the course evaluation, as submitted by participants. The results from the participant course evaluations were very high in all domains evaluated, including course content, practical knowledge learned, instructor knowledge, and instructor teaching ability.

Seventy-seven (80%) completed the follow up attitude and comfort survey. Because of the methodology for calculating the UCLA Geriatric Attitude Scale, which requires responses to all 14 attitude questions, only 70 subjects could be included for analysis. We found no statistical differences in attitudes (Table 3). The pre-class average score was 3.85 (greater scores imply more positive attitudes) and the post-class average score was 3.93 ($p=0.09$). However, we were able to identify a significant change in responses to the comfort questions, which were answered by all 77 individuals. EMS providers expressed a statistically significant increase in comfort in the following domains: 1) communicating with older adults; 2) caring for medical conditions; 3) assessing elder abuse or neglect; and 4) assessing for risk of falling.

Discussion

Given the demographic trends in the United States, it is imperative that EMS providers be able to deliver quality care to older adults.⁴ Delivery of quality care requires the proper medical knowledge specific to the patient population, a positive attitude towards that population, and a certain degree of comfort in caring for that population. Meeting these requirements may be particularly difficult in rural communities where EMS providers are often volunteers who care for relatively few patients. The *GEMS* curriculum and course were developed to address these issues through quality, geriatrics specific training. An improvement of EMS providers' knowledge regarding caring for older adults, attitudes towards older adults, and comfort in delivering care to older adults would suggest improved quality of care.

In this study, we used the provided knowledge post-test to evaluate if the students had achieved a minimum knowledge level regarding caring for older adults. This test did not allow us to determine if the knowledge increased because we did not administer a pre-test. Furthermore, the test has not been evaluated to ensure it properly evaluates important domains of EMS care of older adults. However, all students passed the course, indicating that they achieved a level of knowledge in caring for older adults required by the course publisher.

We also found that the course was well accepted by the students and scored highly in a satisfaction survey. This acceptance and satisfaction is important because poor teaching and organization of the curriculum could lead to a decreased impact of the course.

EMS providers participating in this study generally had positive attitudes towards older adults. We did not identify a significant change in attitude score from exposure to the *GEMS* course, although the results approached statistical significance. Had our sample size been greater, we may have been able to identify a statistically significant difference. However, the meaning of the small change in attitude score between the pre-test and post-test is unclear.⁹

This study did find a statistically significant improvement in EMS providers' comfort in delivering care to older adults three months after successfully completing the *GEMS* course. This improvement is impressive, especially since it was found months after completion of the course. This finding may indicate that the students retained the knowledge and skills taught in the *GEMS* course.

The areas of improvement fell into the domains of communications, caring for medical conditions, elder abuse or neglect, and risk of falling. This was not surprising given the focus areas of the course. Communication with older adults is heavily emphasized in the *GEMS* course, but is not in the EMT-basic curriculum.¹ Caring for medical conditions in older adults is particularly complicated and was another major focus of the course, with almost a third of the course focusing on medical conditions in older adults. Unlike the traditional EMT curriculum, which focuses on diseases as they individually impact patients, the *GEMS* curriculum identifies the challenge of multiple comorbidities and the treatment challenges that result from them. To our knowledge, EMS providers were not provided elder abuse specific training in New York State outside of the *GEMS* course because they are not mandated reporters of elder abuse. This training may have been the first exposure of EMS providers to the topic. Finally, identifying individuals at risk for falling is a prevention and public health activity. Although studies have shown that EMS providers have interests in improving the public health, it has not been emphasized in their clinical activity or training.¹⁰ The *GEMS* course emphasizes both the importance of EMS preventive efforts and public health interventions.

There were a number of limitations to this study and they must be noted. First, the results found among these rural providers may not be generalizable to other EMS providers. The EMS system and staff in urban and suburban regions may be significantly different than in this rural community, leading to a different impact of the course. However, the results found should be generalizable to other rural communities with a similar volunteer EMS system, as was the intent of this study. Second, the impact of the *GEMS* course on various subgroups such as individuals who identified EMS as their primary job, individuals who are older or have participated in EMS for longer times, or individuals who care for greater numbers of patients per week, is unclear. In this rural community the numbers of EMS providers were insufficient to perform subgroup analyses. Third, because the evaluation of the *GEMS* curriculum was a component of a larger EMS screening program evaluation, results may have been confounded. In the screening program, outside of the *GEMS* course, EMS providers evaluated patients for risk of falling, risk of medication interactions and errors, and risk of depression. Although we cannot be certain, the fact that EMS reported increased comfort in evaluating risk of falling but not

the other two realms, leads us to believe that confounding was not present. Fourth, the pre-tests were performed using written surveys and the post-tests were performed using auditory surveys to maximize the response rate and minimize the burden on the participants. This could result in differences in expected responses, but we feel that it would not be significant based upon previous studies with other types of instruments.^{11,12} Finally, we were unable to evaluate the patient-level outcomes of care because we lacked an effective comparison group and we were concerned about bias from differences in documentation between those who took the class and those who did not.

Nonetheless, this study did find that providing the *Geriatric Education for EMS* course to EMS providers practicing in a rural community was beneficial, as represented by a statistically significant improvement in their comfort in caring for older adults. EMS providers at baseline had positive attitudes towards older adults and no significant change in attitudes was identified after the GEMS course. The impact of the training on patient outcomes needs to be identified and the impact of this training in other settings, such as urban and suburban EMS agencies, also needs to be evaluated.

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UCLA Geriatric Attitudes Scale.

DIRECTIONS: Please use the scale to indicate the degree to which you agree or disagree with each statement. There are no right or wrong answers. The best response is the one that truly reflects your personal opinion. Findings of this study will be reported only on a group basis with no individual names identified. “Old people” and “elderly patients” mentioned in the questions refer to persons aged 65 or older.

1. Most old people are pleasant to be with.
2. The federal government should reallocate money from Medicare to research on AIDS or pediatric diseases.
3. If I have the choice, I would rather see younger patient than elder ones.
4. It is society’s responsibility to provide care for its elderly persons.
5. Medical care for old people uses up too much human and material resources.
6. As people grow older, they become less organized and more confused.
7. Elderly patients tend to be more appreciative of the medical care I provide than are younger patients.
8. Taking a medical history from elderly patients is frequently an ordeal.
9. I tend to pay more attention and have more sympathy towards my elderly patients than my younger patients.
10. Old people in general do not contribute much to society.
11. Treatment of chronically ill old patients is hopeless.
12. Old persons don’t contribute their fair share towards paying for their health care.
13. In general, old people act too slow for modern society.

14. It is interesting listening to old people's accounts of their past experiences.

Responses were on a Likert scale ranging from strongly disagree (1) to strongly agree (5).

Comfort Survey, developed for this study.

DIRECTIONS: Please use the scale to indicate your level of comfort with caring for these types of patients. There are no right or wrong answers. The best response is the one that truly reflects your personal opinion. "Old people" and "elderly patients" mentioned in the questions refer to persons aged 65 or older.

1. Comfort caring for older adults with medical complaints.
2. Comfort caring for older adults suffering from traumatic symptoms.
3. Comfort caring for older adults with psychiatric complaints.
4. Comfort assessing older adults for elder abuse or neglect.
5. Comfort communicating with older adults.
6. Comfort caring for older adults with end of life issues.
7. Comfort assessing older adults for risk of falling.
8. Comfort evaluating patients for medication problems.

Responses were on a Likert scale ranging from extremely uncomfortable (1) to extremely comfortable (5).

Figure 1. Attitude and Comfort Survey Questions

Table 1**Student Demographic Data (N=88)**

Age, years (mean, standard deviation)	43 (13)
Years active in EMS (median, interquartile range)	8 (2, 18)
Gender, female	45 (51%)
Race	
White	82 (93%)
Black	1 (1.1%)
Other	5 (5.7%)
Ethnicity, Hispanic	2 (2.3%)
EMS Certification Level	
Basic Life Support	69 (78%)
Advanced Life Support	19 (22%)
EMS is Primary Job	13 (15%)
Patients Cared for in Average Week	
<5	62 (70%)
5-10	14 (16%)
>10	12 (14%)
Older Adult Patients Cared for in Average Week	
<5	73 (83%)
5-10	8 (9.1%)
>10	7 (8.0%)
Reason for Taking Class*	
Personal Interest	53 (60%)
Recertification Requirement	46 (52%)
Other	21 (24%)

* Multiple answers possible

Table 2

Evaluation of Class and Teaching

	Response*					No Response
	1 Very Dissatisfied	2	3	4	5 Very Satisfied	
Course Evaluation						
Overall satisfaction with course	0	1 (1.1%)	2 (2.3%)	21 (24%)	58 (66%)	6 (6.8%)
Satisfaction with content	0	1 (1.1%)	2 (2.3%)	19 (22%)	61 (69%)	5 (5.7%)
Satisfaction with presentation of topics	0	0	4 (4.6%)	19 (22%)	60 (68%)	5 (5.7%)
Satisfaction with practical knowledge learned	0	1 (1.1%)	4 (4.6%)	28 (32%)	50 (57%)	5 (5.7%)
Instructor Evaluation						
Satisfaction with instructors' knowledge	0	0	1 (1.1%)	11 (12%)	71 (81%)	5 (5.7%)
Satisfaction with clarity of answers	0	0	0	18 (20%)	65 (74%)	5 (5.7%)
Satisfaction with teaching ability	0	0	0	15 (17%)	68 (77%)	5 (5.7%)
Satisfaction with enthusiasm about the course	0	0	2 (2.3%)	13 (15%)	68 (77%)	5 (5.7%)

* 1-5 with 1 representing "Very Dissatisfied" and 5 representing "Very Satisfied".

Table 3

Attitude and Comfort Evaluation

	Pre-Class Score	Three Month Follow Up Score	p-value
Average Attitude Score (n=70)* mean, standard deviation	3.85 (0.40)	3.93 (0.34)	0.09
Comfort Questions (n=77)* median, interquartile range			
Communicating with older adults	4 (4, 5)	5 (4, 5)	0.014
Caring for medical conditions	4 (4, 5)	5 (4, 5)	0.016
Caring for traumatic conditions	4 (3, 4)	4 (4, 5)	0.073
Caring for psychiatric conditions	4 (3, 5)	4 (3, 4)	ns
Caring for older adults with end of life issues	4 (3, 5)	4 (3, 5)	ns
Assessing elder abuse or neglect	3 (2, 4)	4 (3, 5)	0.010
Assessing for risk of falling	4 (3, 5)	5 (4, 5)	0.002
Evaluating for medication problems	4 (3, 4)	3 (3, 4)	ns

ns=Not Significant

* Greater values represent more positive attitudes.