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Do EMS Professionals Think They Should Participate in Disease Prevention?

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Abstract

Objective—To determine EMS professionals' opinions regarding participation in disease and injury prevention programs. A secondary objective was to determine the proportion of EMS professionals who had participated in disease prevention programs.

Methods—As part of National Registry of Emergency Medical Technician's biennial re-registration process, EMS professionals re-registering in 2006 were asked to complete an optional survey regarding their opinions on and participation in disease and injury prevention. Demographic characteristics were also collected. Data were analyzed using descriptive statistics and 99% confidence intervals. The chi square test was used to compare differences by responder demographics ($\alpha=0.01$). A 10% difference between groups was determined to be clinically significant.

Results—The survey was completed by 27,233 EMS professionals. 82.7% (99%CI: 82.1 – 83.3) felt that EMS professionals should participate in disease prevention, with those working 20 to 29 hours per week being the least likely to think they should participate (67.4%, $p<0.001$). 33.8% (99% CI: 33.1 – 34.6) of respondents reported having provided prevention services, with those having a graduate degree (43.5%, $p<0.001$), those working in EMS for more than 21 years (44%, $p<0.001$), those working for the military (57%, $p<0.001$), those working 60 to 69 hours per week (41%, $P<0.001$), and those responding to 0 emergency calls in a typical week (43%, $P<0.001$) being the most likely to report having provided prevention services. 51.1% (99%CI: 50.4 – 51.9) of respondents agreed that prevention services should be provided during emergency calls and 7.7% (99%CI: 7.3 – 8.1) of respondents reported providing prevention services during emergency calls. No demographic differences existed. Those who had participated in prevention programs were more likely to respond that EMS professionals should participate in prevention (92% versus 82%, $p<0.001$). Further, those who had provided prevention services during emergency calls were more likely to think EMS professionals should provide prevention services during emergency calls (81% versus 51%, $p<0.001$).

Conclusion—The majority of EMS professionals thought that they should participate in disease and injury prevention programs. The respondents were mixed as to whether prevention services

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should be provided while on emergency calls, but those with experience providing these services were more likely to agree with providing them during emergency calls.

Keywords

Emergency Medical Services; Emergency Medical Technicians; Prevention

Introduction

The potential positive impact to the public's health of the Emergency Medical Services (EMS) system participating in disease and/or injury prevention has long been recognized.^{1, 2} In 1996, the National Highway Traffic Safety Administration and the Health Resources and Services Administration published the "EMS Agenda for the Future," which stated that EMS has "the ability to identify and modify illness and injury risks...and contribute to the treatment of chronic conditions and community health monitoring."² It has been suggested that EMS could positively impact elder abuse, child abuse, basic care of the elderly, substance abuse, fire hazards, domestic violence, accidental poisoning, hazardous road conditions, and infectious disease outbreaks.³

EMS professionals are an excellent resource for prevention programs. They enter patients' homes, schools and workplaces at unscheduled times, when potential high-risk environments are most likely to be identified. They are widely dispersed throughout communities and care for patients regardless of resources or health system affiliations, including those who refuse transport to an emergency department. Furthermore, they are likely to be respected by community members as knowledgeable medical professionals.⁴

Many EMS agencies have participated in prevention programs, such as providing influenza vaccinations, conducting home safety inspections, leading community education programs, and distributing child safety seats.⁵⁻⁸ However, most of these programs have taken place outside of their emergency response duties. Providing prevention services while engaged in emergency responses is rare, but has been used to provide smoke detectors, measure carbon monoxide levels, assess patients' risk for falling, need for vaccinations, and identification of possible domestic violence.⁹⁻¹⁵ While prevention services provided outside of emergency responses are important and provide benefit to the community, EMS professionals' greatest potential for playing a significant role in preventing diseases may be during emergency calls because this is a unique service that only EMS professionals can provide and their benefits are maximized.

While previously published studies and reports have shown that EMS professionals can conduct disease and/or injury prevention screening or interventions, they did not determine providers' willingness or interest in participating in prevention programs and the role EMS professionals feel they should play in preventing illness and injury. A recent survey of paramedics in a single system showed that 70% believed that primary injury prevention should be a core EMS mission.¹⁶ However, that study was conducted in only one location and did not encompass the various types of EMS professionals.

The objective of this study was to determine EMS professionals' opinion on whether they should provide prevention services in general as well as during emergency calls. A secondary objective was to determine the proportion of professionals who have participated in such programs.

Methods

The National Registry of Emergency Medical Technicians (NREMT) provides national EMS certification to EMS professionals throughout the United States. Currently there are approximately 286,000 EMS professionals certified by the NREMT. The NREMT requires that individuals maintain their certification through a biennial re-registration process. To facilitate this process they send re-registration notices to half of all registered EMS professionals annually. In 2006, this notice was sent to approximately 143,000 individuals. The notice included an optional survey, which has been utilized to identify trends among EMS professionals. Completion of the optional survey has no bearing on an individual's registration status.

The 2006 NREMT re-registration optional survey included 4 questions on disease and injury prevention designed by the authors. The questions asked about providers' willingness to participate in disease and/or injury prevention and if they had ever participated in a formal prevention project (figure 1). Demographic information was also collected on the survey. This included education level, years of service in EMS, level of provider, community size, type of EMS service, role with the EMS service, number of calls per week and hours worked per week. The variable "role with the EMS service" allowed for multiple responses.

After the surveys were returned to the NREMT, the data was de-identified and entered into a Microsoft Excel (Redmond, WA) spreadsheet and sent to the authors. Data was analyzed using descriptive statistics and 99% confidence intervals (99% CI). To determine if a relationship existed between demographic characteristics and the providers' willingness to participate in prevention, a difference of more than 10% between groups was considered clinically important and categories with less than 30 respondents were collapsed. This could not be done for the variable "role with the EMS service" because multiple responses were allowed. Chi Square was used to compare groups ($\alpha=0.01$). A logistic regression model was built with those variables that were found to be statistically and clinically significant during the univariate analyses. The odds ratios (OR) and 99% confidence intervals from these models are reported.

The Institutional Review Boards at the University of Rochester and the Medical College of Wisconsin determined that this study was exempt from their review.

Results

Of the EMS professionals who received the re-registration notice a total of 56,824 re-registered for NREMT certification in 2006.¹⁷ Of those who re-registered, 27,233 (48%) professionals completed the optional survey. This analysis included all 27,233 providers who completed the survey. Table 1 shows a comparison by demographics of the percent of respondents who answered positively to each of the survey questions.

When asked if EMS professionals should participate in disease prevention, 82.7% (99% CI: 82.1 –83.3) said yes. When compared by demographics, professionals who worked 20 to 29 hours per week were the least likely to think they should participate in prevention (67.4%, $p<0.001$). The odds ratio for thinking EMS professionals should participate in prevention was 0.43 (99% CI: 0.35 – 0.53) for those working 20 to 29 hours per week. The full multivariate model is shown in Table 2.

One-third (33.8%; 99% CI: 33.1 – 34.6) of respondents reported actually having provided prevention services. Those who had a graduate degree were the most likely to have reported providing prevention services (43.5%, $p<0.001$), as were those who had worked in EMS for more than 21 years (44%, $p<0.001$), those who worked for the military (57%, $p<0.001$), those who worked 60 to 69 hours per week (41%, $P<0.001$), and those who reported typically

responding to 0 emergency calls per week (43%, $P < 0.001$). The odds ratio for reporting to have provided prevention services was 2.02 (99% CI: 1.64 – 2.50) for those who had a graduate degree, 2.42 (99% CI: 1.67 – 3.50) for those who had worked in EMS for more than 21 years, 4.61 (99% CI: 4.03 – 5.27) for those who worked for the military, 1.56 (99% CI 1.26–1.92) for those who worked 60 to 69 hours per week, and 0.66 (99% CI: 0.52 – 0.85) for those who reported typically responding to 0 emergency calls per week. The full multivariate model is shown in Table 3.

When asked if prevention services should be provided during emergency calls 51.1% (99% CI: 50.4 – 51.9) of respondents said yes. This was similar in all demographic categories. Less than one-tenth (7.7%; 99% CI: 7.3 – 8.1) of respondents reported having provided prevention services during emergency calls and no demographic differences existed.

Those who had participated in prevention programs were more likely to respond that EMS professionals should participate in prevention (92% versus 82%, $p < 0.001$). Further, those who had provided prevention services during emergency calls were more likely to think EMS professionals should provide prevention services during emergency calls (81% versus 51%, $p < 0.001$).

Discussion

This nation-wide survey of Nationally Registered EMS professionals found that a large majority thought they should provide prevention services (82.7%). This is slightly higher than the findings of Jaslow, who, in 2002, found that in their system 70% of EMS professionals thought injury prevention should be a core EMS mission.¹⁶ This indicates that EMS professionals agree with their national leaders and view themselves as an important public health resource for disease and injury prevention.

The finding that very few respondents had actually participated in providing prevention services is disappointing. Only one-third of respondents reported having provided these services. This indicates that this potentially valuable public health resource has largely not been integrated into the public health and prevention infrastructure in the United States. However, as opportunities arise for EMS to become involved in prevention programs, so too may the number of professionals who participate in them. Additionally, increased recognition of these programs may increase the number of EMS professionals who participate. For example, since 2002, the Journal of Emergency Medical Services and the EPIC (Eliminating Preventable Injuries in Children) Medics program have annually awarded the Nicolas Rosecrans Award for Excellence in Injury Prevention to an EMS provider or agency.⁷ The prevention work of the EMS provider or agency is then highlighted at a national EMS meeting and in the journal.

When EMS professionals should provide prevention services is less clear. Only half of our respondents thought they should provide these services during emergency calls. This is substantially less than the proportion of respondents who thought EMS should participate in prevention, perhaps indicating that approximately 30% think they should participate in prevention but not during emergency calls. EMS professionals may be concerned that these types of programs may distract them from providing emergency care or that patients who perceive themselves to be in an emergency situation may not want to discuss things that are unrelated to their current complaint. It is of interest to note that studies where EMS has provided prevention services during emergency calls report that EMS professionals performed their assessments only during appropriate calls and did not report receiving complaints from the patients or families who had requested emergency services.^{9, 10, 15}

It is important to note that EMS professionals who reported having participated in prevention programs were more likely to think EMS should participate. This may indicate that the reality

of providing such services is not as difficult as EMS professionals might perceive. Given that EMS professionals are among the very few health care providers who see a patient's home at unscheduled times and that they see all patients regardless of their health care affiliation, they can play a unique and important role in prevention. This role can make a difference in the health and safety of their patients even if transportation to an emergency department is not provided. For example, in a study of EMS patients who were likely to be victims of domestic violence, 23% of those patients refused transport and were never seen in an emergency department.¹⁸

Those most likely to report having provided prevention services had more education, had worked longer and for more hours per week. None of these findings seemed surprising given that the more a provider works the more opportunity they would have to participate in prevention. A surprising finding was that EMS professionals who typically responded to zero calls per week were the most likely to report having provided prevention services. We hypothesize two potential explanations for this finding. It may be a function of the respondent's job assignment (e.g., some agencies may assign specific staff to engage in community prevention as their job function) or it may show that these respondents have more time to provide prevention services. However, when the number of calls per week variable was entered into the logistic regression model with the other significant demographic variables the odds ratio for zero calls per week was less than one. This indicates that when the other significant demographic variables were held constant responding to zero calls per week was actually a significant predictor of not having participated in prevention programs. Therefore, further work is needed to explore the effect of calls per week on participating in prevention programs.

Limitations

The primary limitation of this study is potential sampling bias. We only surveyed EMS professionals who had obtained national certification and were re-registering for their certification. The findings are only generalizable to nationally registered EMS professionals. Further, of the individuals who re-registered in 2006, only approximately one-half chose to complete the optional survey. It is plausible that our respondents may be fundamentally different from those who did not complete the survey. Finally, because this study utilized a survey, all information is self-reported and therefore includes all of the potential biases that may be associated with that study design.

It is also important to recognize that while this study found that EMS professionals believe they should participate in injury prevention. It is unknown which if any EMS initiated prevention programs are effective. It will be important for EMS professionals, considering participating in prevention efforts, to carefully evaluate the available data and select programs that will have a positive outcome. These programs should be monitored and evaluated to ensure they are having the desired effect. For example, a Milwaukee, WI program found that in homes where the fire department had provided smoke detectors, a very low percent (35%) still had an operating smoke detector when the dwelling actually had a fire.⁹

Conclusions

The majority of EMS professionals thought that they should participate in disease and injury prevention programs. The respondents were mixed as to whether prevention services should be provided while on emergency calls, but those with experience providing these services were more likely to agree with providing them during emergency calls.

Acknowledgments

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1) Do you think that EMS providers should participate in disease prevention (for example, providing vaccines, promoting helmet use for bicycles, etc.)?

81% Yes 15% No

2) Have you ever participated in a formal disease prevention program?

33% Yes 61% No

3) Do you think that EMS providers should provide disease prevention services during emergency calls (for example, determining if elderly patients have received the flu vaccine, in order to notify emergency department staff)?

50% Yes 44% No

4) Have you ever participated in a formal disease prevention program where the intervention was provided during emergency calls?

8% Yes 84% No

*Percents do not add to 100% due to non-responses.

Figure 1.
The four survey questions

Table 1
Comparison by demographics of the percent of respondents who answered positively to the survey questions.

| | Question 1: Believe Providers Should Participate in prevention (%) | Question 2: Had Participated in prevention programs (%) | Question 3: Believe Providers Should Participate in prevention during emergency calls (%) | Question 4: Had Participated in prevention programs during emergency calls (%) |
|---|---|---|--|--|
| Highest Level of Education Completed | | | | |
| High School or Less | 84 | 29 | 51 | 8 |
| Some College | 86 | 35 | 54 | 8 |
| Associate Degree | 86 | 39 | 52 | 10 |
| Bachelors Degree | 85 | 36 | 54 | 8 |
| Graduate Degree | 85 | 43 | 56 | 8 |
| Number of Years Worked as an EMT | | | | |
| < 1 year | 87 | 27 | 59 | 8 |
| 1 – 2 years | 86 | 31 | 57 | 8 |
| 3 – 4 years | 86 | 33 | 54 | 8 |
| 5 – 7 years | 85 | 33 | 51 | 7 |
| 8 – 10 years | 84 | 35 | 52 | 8 |
| 11 – 15 years | 85 | 36 | 51 | 8 |
| 16 – 20 years | 85 | 41 | 52 | 8 |
| > 21 years | 86 | 44 | 55 | 10 |
| Level of Practice as an EMT | | | | |
| Basic | 84 | 37 | 53 | 9 |
| Intermediate/85 | 84 | 30 | 51 | 8 |
| Intermediate/99 | 81 | 32 | 46 | 9 |
| Paramedic | 86 | 33 | 55 | 8 |
| Not Currently Practicing | 87 | 38 | 55 | 7 |
| Community Size Where Work as an EMT | | | | |
| Rural Area (less than 2,500) | 81 | 30 | 51 | 7 |
| Small Town (2,500– 24,999) | 86 | 34 | 51 | 7 |
| Medium Town (25,000 – 74,999) | 86 | 35 | 53 | 9 |
| Large Town (75,000 – 149,000) | 86 | 39 | 55 | 9 |

| | Question 1: Believe Providers Should Participate in prevention (%) | Question 2: Had Participated in prevention programs (%) | Question 3: Believe Providers Should Participate in prevention during emergency calls (%) | Question 4: Had Participated in prevention programs during emergency calls (%) |
|---|---|--|--|---|
| Mid-Sized City (less than 500,000) | 86 | 35 | 56 | 8 |
| Suburban/Fringe of a Mid-Sized City | 84 | 36 | 52 | 9 |
| Large City (more than 500,000) | 86 | 38 | 56 | 10 |
| Suburban/Fringe of a Large City | 84 | 37 | 56 | 7 |
| Type of EMS Service Where Work Most | | | | |
| Fire-Based | 79 | 29 | 49 | 7 |
| Private, For Profit | 88 | 31 | 57 | 8 |
| Hospital-Based | 89 | 33 | 54 | 8 |
| Military | 86 | 57 | 55 | 12 |
| County or Municipal Based | 87 | 30 | 54 | 7 |
| Private, Not for Profit | 87 | 28 | 54 | 7 |
| US Federal Govt (non-military) | 79 | 37 | 57 | 10 |
| Not affiliated with an Organization | 87 | 31 | 58 | 4 |
| Role(s) in EMS System | | | | |
| Field Provider | 85 | 34 | 53 | 8 |
| Field Supervisor | 87 | 44 | 55 | 10 |
| Upper Management | 87 | 50 | 56 | 12 |
| Medical Director | 90 | 38 | 56 | 12 |
| Educator | 91 | 48 | 58 | 11 |
| Number of Calls Responded to in a Typical Week | | | | |
| 0 | 84 | 43 | 53 | 6 |
| 1 | 79 | 31 | 50 | 7 |
| 2-4 | 84 | 36 | 51 | 8 |
| 5-9 | 86 | 35 | 54 | 9 |
| 10-19 | 85 | 32 | 52 | 8 |
| 20-29 | 87 | 32 | 55 | 9 |
| 30-39 | 85 | 32 | 56 | 9 |

| | Question 1: Believe Providers Should Participate in prevention (%) | Question 2: Had Participated in prevention programs (%) | Question 3: Believe Providers Should Participate in prevention during emergency calls (%) | Question 4: Had Participated in prevention programs during emergency calls (%) |
|---------------------------------------|---|--|--|---|
| 40 – 49 | 84 | 36 | 58 | 12 |
| >50 | 85 | 37 | 58 | 12 |
| Hours Worked in a Typical Week | | | | |
| 1 – 5 | 83 | 29 | 50 | 5 |
| 6 – 9 | 85 | 30 | 48 | 5 |
| 10 – 19 | 88 | 32 | 55 | 8 |
| 20 – 29 | 67 | 31 | 53 | 7 |
| 30 – 39 | 88 | 35 | 54 | 6 |
| 40 – 49 | 87 | 36 | 54 | 8 |
| 50 – 59 | 83 | 35 | 51 | 8 |
| 60 – 69 | 85 | 41 | 55 | 11 |
| >70 | 85 | 38 | 54 | 10 |

Table 2
 Logistic Regression Model for Providers' Willingness to Participate in Prevention

| | | Question 1: Believe Providers Should Participate in prevention (%) | | |
|--------------------------------|---------|--|------|-------------|
| | | OR | P | 99%CI |
| Hours Worked in a Typical Week | 1 – 5 | Reference | | |
| | 6 – 9 | 1.20 | 0.10 | 0.90 – 1.60 |
| | 10 – 19 | 1.48 | 0.00 | 1.14 – 1.91 |
| | 20 – 29 | 0.43 | 0.00 | 0.35 – 0.53 |
| | 30 – 39 | 1.47 | 0.00 | 1.13 – 1.92 |
| | 40 – 49 | 1.40 | 0.00 | 1.18 – 1.67 |
| | 50 – 59 | 0.99 | 0.92 | 0.83 – 1.18 |
| | 60 – 69 | 1.23 | 0.02 | 0.98 – 1.55 |
| | >70 | 1.21 | 0.01 | 0.99 – 1.48 |

Table 3
Logistic Regression Model for Providers Reporting Having Participated in Prevention

| | | Question 2: Had Participated in prevention programs (%) | | |
|---|------------------------------------|---|-----------|-------------|
| | | OR | P | 95%CI |
| Highest Level of Education Completed | High School or Less | | Reference | |
| | Some College | 1.26 | 0.00 | 1.12 – 1.41 |
| | Associate Degree | 1.49 | 0.00 | 1.31 – 1.70 |
| | Bachelors Degree | 1.38 | 0.00 | 1.20 – 1.58 |
| | Graduate Degree | 2.02 | 0.00 | 1.64 – 2.50 |
| Number of Years Worked as an EMT | < 1 year | | Reference | |
| | 1 – 2 years | 1.07 | 0.62 | 0.75 – 1.53 |
| | 3 – 4 years | 1.19 | 0.22 | 0.83 – 1.71 |
| | 5 – 7 years | 1.23 | 0.14 | 0.86 – 1.76 |
| | 8 – 10 years | 1.47 | 0.01 | 1.02 – 2.11 |
| | 11 – 15 years | 1.62 | 0.00 | 1.13 – 2.32 |
| | 16 – 20 years | 1.93 | 0.00 | 1.34 – 2.79 |
| | > 21 years | 2.42 | 0.00 | 1.67 – 3.50 |
| Community Size Where Work as an EMT | Rural Area (less than 2,500) | | Reference | |
| | Small Town (2,500 – 24,999) | 1.11 | 0.04 | 0.98 – 1.26 |
| | Medium Town (25,000 – 74,999) | 1.22 | 0.00 | 1.06 – 1.40 |
| | Large Town (75,000 – 149,000) | 4.61 | 0.00 | 4.03 – 5.27 |
| | Mid-Sized City (less than 500,000) | 1.10 | 0.06 | 0.97 – 1.24 |

| | | Question 2: Had Participated in prevention programs (%) | | |
|---|-------------------------------------|--|----------|--------------|
| | | OR | P | 95%CI |
| | Suburban/Fringe of a Mid-Sized City | 1.01 | 0.81 | 0.87 – 1.19 |
| | Large City (more than 500,000) | 1.45 | 0.00 | 1.14 – 1.83 |
| | Suburban/Fringe of a Large City | 1.32 | 0.10 | 0.86 – 2.05 |
| Number of Calls Responded to in a Typical Week | 0 | 0.66 | 0.00 | 0.52 – 0.85 |
| | 1 | 0.81 | 0.04 | 0.63 – 1.05 |
| | 2 – 4 | 0.96 | 0.68 | 0.76 – 1.21 |
| | 5 – 9 | 0.96 | 0.65 | 0.76 – 1.21 |
| | 10 – 19 | 0.87 | 0.12 | 0.70 – 1.09 |
| | 20 – 29 | 0.88 | 0.14 | 0.70 – 1.10 |
| | 30 – 39 | 0.86 | 0.12 | 0.66 – 1.11 |
| | 40 – 49 | 1.00 | 0.99 | 0.72 – 1.38 |
| | >50 | Reference | | |
| Hours Worked in a Typical Week | 1 – 5 | Reference | | |
| | 6 – 9 | 1.06 | 0.53 | 0.83 – 1.37 |
| | 10 – 19 | 1.12 | 0.19 | 0.90 – 1.40 |
| | 20 – 29 | 1.22 | 0.03 | 0.97 – 1.53 |
| | 30 – 39 | 1.27 | 0.01 | 1.01 – 1.59 |
| | 40 – 49 | 1.22 | 0.00 | 1.04 – 1.44 |
| | 50 – 59 | 1.27 | 0.00 | 1.06 – 1.51 |

| | | Question 2: Had Participated in prevention programs (%) | | |
|--|---------|--|----------|--------------|
| | | OR | P | 95%CI |
| | 60 – 69 | 1.56 | 0.00 | 1.26 – 1.92 |
| | >70 | 1.48 | 0.00 | 1.22 – 1.79 |