

Developing role models for health in the fire service: a pilot case study

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Summary

Objectives: The objectives of this case study were to develop role models for health in the fire service through knowledge and behaviour change, to improve the role models' own health, and to facilitate behaviour change in other firefighters through their example.

Design: Volunteers interested in improving their own health and serving as role models to others in the fire service were identified at a statewide Maryland fire service leadership meeting.

Setting: Participants worked with the Johns Hopkins Weight Management Center to learn how to improve their own health and shared that knowledge with others in their fire departments.

Participants: Three Maryland fire service leaders were recruited at a leadership meeting with the goal of improving their own health and becoming role models. One participant dropped out shortly after beginning, while two male participants, aged 57 and 61, completed the study.

Main outcome measures: Quantitative measures were collected at baseline and 12 months, and included weight, blood pressure and fasting glucose and cholesterol. Semi-structured interviews were conducted approximately 14 months postintervention to determine the participants' perceptions of their own health and impact on others in the fire service.

Results: Each participant had biweekly to monthly visits over a one-year period to learn the knowledge and skills that would assist him with improving dietary behaviours, increasing fitness and achieving a healthy weight. Case study participants experienced reductions in body weight (–13% and –11% of total body weight), glucose and blood pressure. Qualitative one-on-one interviews conducted postintervention with the participants revealed that they embraced their status as role models and felt their success inspired other firefighters. Their experiences suggest that role models can play an important role in helping firefighters increase self-efficacy, self-regulation and social support in the workplace environment.

Conclusions: These findings provide promising evidence for the use of role models to improve health, especially in the workplace.

Keywords

occupational health, psychology, public health, role models, behaviour change, firefighters, workplace wellness, peer support

Introduction

In the U.S., there are more than 1 million firefighters who not only fight fires but also respond to medical emergencies and motor vehicle crashes.¹ Although firefighters' work duties can be physically demanding, there is evidence that both paid and volunteer firefighters suffer from high levels of chronic health conditions, especially obesity, hyperlipidemias and hypertension.² Data collected by the National Fire Protection Association (NFPA) have shown sudden cardiac death to be the perennial leading cause of death among firefighters in the line of duty.³ Excess weight is one of the primary contributors to cardiovascular disease in this population.²

The health status of firefighters is also concerning if their health causes them to be less effective in performing their duties. Recognising the importance of cardiovascular health and physical fitness, the NFPA released Standard 1583, which establishes requirements for health-related fitness programmes for firefighters.⁴

The unhealthful behaviours exhibited by firefighters can be especially hard to change, as these behaviours are perpetuated by the distinct social culture of firefighting. Firefighters tend to develop more intimate relationships with co-workers as they often eat, exercise and rest with peers while fulfilling their shift duties.⁵ Immersion in a social environment,

where workplace factors promote unhealthful lifestyles and colleagues model unhealthful behaviours, creates an environment where unhealthful behaviours are seen as the norm, perpetuating bad habits. Given the distinctive social culture in firehouses, a workplace intervention using trained role models may be an effective way to promote healthier eating and fitness habits.

Some firehouses have attempted to overcome the forces responsible for poor health behaviours among firefighters by organising initiatives to improve the health and fitness of employees. For instance, the International Association of Firefighters developed the Fire Service Joint Labor Management Wellness Fitness Initiative, a comprehensive programme for fire departments to improve firefighters' health and fitness by implementing medical physicals, fitness programmes, and injury and medical rehabilitation, and by providing mental health services.⁶ In addition, The National Fallen Firefighters Foundation implemented the Everyone Goes Home Program, a programme of 16 initiatives aimed at decreasing the number of annual firefighter deaths, including a focus on improving firefighters' physical and mental health.⁶ Despite these national priorities and initiatives, there have still not been substantial improvements in the health of firefighters, therefore, calling for new ideas to improve the culture at firehouses.

Theoretical rationale for the use of role models to change health behaviour is provided by social cognitive theory (SCT). SCT explains human behaviour by describing ways in which personal factors, environmental influences and behaviour interact and affect each another.⁷ It is the theory most commonly cited in the literature regarding role models,^{8,9} because it explains how social relationships can influence behaviour. According to SCT, individuals learn not only from personal experience but also by 'observational learning'.¹⁰ An individual's behaviour can be impacted by watching a role model's actions and the positive and negative outcomes associated with those actions. In situations where the model is successful or receives positive reinforcement, observational learning has the potential to increase self-efficacy, the belief that one can successfully execute a behaviour.¹¹ Self-efficacy has proved an important element in creating desired behaviour change.⁷ SCT also highlights the importance of self-regulation in changing behaviour.⁷ Self-regulation is achieved by self-monitoring, goal-setting, feedback, self-reward, self-instruction and enlistment of social support.⁷ Role models can help others to achieve self-regulation by engaging in self-regulatory actions themselves, giving others advice and by providing social support. Interestingly, studies have shown that the role

model's perceived similarity to the observer can increase the likelihood that behavioural imitation will occur, suggesting that role models in the same profession are especially likely to be effective.⁷

Several studies have specifically examined the effect of peers on eating and exercise behaviour. Goldman *et al.*¹² found that food consumption was strongly affected by a model's eating pattern, regardless of the observer's level of hunger. Similarly, Christakis and Fowler¹³ found that individuals were more likely to be obese if their friends and family were obese. Both studies demonstrate the influential role of one's social network on health behaviours, and therefore health outcomes.

Other studies have examined the power of social influence as a tool for motivating healthful behaviours in the workplace. Spicer and Miller¹⁴ found that an intervention programme targeting substance use on the job was able to reduce injuries in the workplace. In this intervention, volunteer union workers were trained to recognise, intervene with, and refer a co-worker with a drug or drinking problem. In another study, an intervention that used role models to increase cancer screening in the workplace was found to be moderately effective in increasing screening for certain types of cancer.¹⁵

The promising results from research on the use of role models in workplace interventions, combined with the social nature of firehouses, suggest that this type of intervention might be effective in driving positive health behaviour changes among firefighters. The use of role models described below was subsequently used to inform a larger, multimodal intervention in firehouses, the results of which will be published separately.

Methods

Ethical approval for this study was provided by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board. Written consent was obtained from the study participants, with additional oral consent obtained before conducting postintervention interviews.

In December 2008, members of the study team attended a Maryland fire service leadership meeting and recruited senior-level firefighters interested in working with the Johns Hopkins Weight Management Center (WMC) to improve their health, and possibly become role models for other firefighters. Fire service leaders were chosen because they are highly visible. As role models, it was thought that they would be able to motivate their colleagues to change behaviour by sharing their personal experience in attempting to lose weight and become healthier.

Eleven individuals initially expressed interest in being a role model and three committed to enrol in the study as role models. One of the three was unable to comply with dietary recommendations and dropped out of the programme. The final sample involved two participants who wished to lose weight as a means of improving obesity-related co-morbidities (primarily hypertension and diabetes). The two were males, aged 57 (Participant #1) and 61 (Participant #2) years.

The two participants underwent standard assessments at the WMC, which included meeting with a physician, dietitian, exercise physiologist and behaviourist, in addition to having blood tests for fasting glucose and cholesterol levels. Individualised diet plans were formulated for each, and periodic (initially biweekly, later monthly) follow-up visits ensued over the course of a year. At the follow-up visits, weights were obtained and food records were reviewed when available, with support and guidance provided. Blood tests were repeated at 12 months. The participants communicated freely and shared knowledge with each other both in person at work-related events and by telephone. They each communicated with others who work in the fire service at the fire departments with which they are associated, at fire-related events throughout the state, and at a peer advocacy training for other potential role models.

Fourteen months post intervention, semi-structured telephone interviews were conducted with each participant by a trained team member. Several questions were developed by the research team to guide the interviews. Each interview lasted approximately 30 min and elicited information about the participants' perceptions of their own health and impact on other firefighters' behaviours.

Results

The medical effects of this moderately intensive intervention on the role models' own health were quite

favourable both in terms of reducing excess body weight and mitigating or resolving health problems related to obesity (Table 1). At baseline, Participant #1 (age 57) was overweight, on the verge of being obese, and had hypertension and high cholesterol. By the end of the intervention, he had lost significant weight and was able to stop taking all blood pressure and cholesterol medications (under the supervision of his physician). Participant #2 (age 61) achieved similar results. At baseline, he was also overweight, on the verge of being obese, and had hypertension, coronary artery disease, and was prediabetic. Through the course of the intervention, he lost significant weight and was able to discontinue use of one medication for blood pressure, and reduce the dose of another. Cholesterol changes could not be interpreted pre-versus postweight loss since medications that were lowering the baseline blood cholesterol levels were discontinued after weight loss.

The results from the one-on-one, postintervention interviews provided the study team with narratives of the participants' challenges and successes. These narratives illustrated how behaviour change principles outlined by SCT may have produced changes among the firefighters. Both role models reported examples of observational learning; they believed their success in making positive health behaviour changes influenced other firefighters to do the same. Firefighters who witnessed the objective markers of their leader's success (e.g. weight loss, increased physical activity) appeared to have been motivated to adopt healthier lifestyle practices themselves. One of the role models shared that modelling healthy behaviour for his colleagues had been rewarding: 'Now when I see other people who have picked up on what I was doing, and I feel that I was an influence on them to cause their change, I feel good'.

There is also qualitative evidence that demonstrates the effect of peer support on facilitating behaviour change in others. Responses to the semi-structured interview questions were similar between

Table 1. Change in health indicators from baseline to 12 months.

	Role model 1, 57-year-old man			Role model 2, 61-year-old man		
	Baseline	12 months	Change	Baseline	12 months	Change
Weight (kg)	97.8	85.1	-12.7 (-13.0%)	83.6	74.6	-9.0 (-10.8%)
BMI ^a (kg/m ²)	29.2	25.6	-3.6	29	25.8	-3.2
Blood pressure (mmHg)	130/76	126/72	-4/-4	124/85	116/78	-8/-7
Fasting glucose (mg/dL)	99	95	-4	121	95	-26

^aBody mass index (calculated as weight (kg)/(height (m)²).

the two with respect to how they changed their own behaviour and tried to influence others, although Participant #1 provided more detailed responses and was generally more enthusiastic about being a role model compared to Participant #2. At one point early during the intervention period, Participant #2 was struggling to lose weight and adhere to the prescribed diet. Participant #1 provided social support and motivation to his colleague by sharing his strategies for staying on track, such as keeping detailed food records for review by the dietitian, and, in his words, '[the other role model] started doing what I was doing and he started seeing success'.

With their striking success at dietary behaviour change, sustained for years since initial weight loss, both continue to serve as role models for their colleagues. An example of this continued influence was highlighted when members of the study team attended a fire service leadership meeting in February 2012 (the same meeting in which the role models were recruited in 2008). At the meeting, several firefighters reported that they were impressed with the sustained weight loss of the role models, and that this had motivated them to also lose weight. One firefighter shared, 'If he can do it, so can I!'

In addition to setting the stage for observational learning, the role models worked to increase the self-efficacy of new peer role models in undertaking behavioural change. In a later phase of the same study that initially recruited the role models, they participated in a training of new 'peer advocates' (who would be part of a pilot intervention at their respective fire stations). The role models shared their experiences with the goal of motivating and encouraging the peer advocates, and worked to help them believe that they could change their own health behaviour and motivate others to do the same. One of the peer advocates, who himself was obese, expressed that he was so inspired by one of the role models and his successful weight loss, that he wanted to follow his example. The role-model-in-training went on to lose 65 pounds over the next year.

Discussion

These initial results and observations indicate that, despite the challenges the firefighting work environment poses to individuals, some are able to make and sustain positive lifestyle changes such as losing weight, improving dietary habits and becoming more physically active. Since participants self-selected for this study, it is possible that the results were

influenced by selection bias. It is also axiomatic that strong self-motivation is a prerequisite for being a good role model. While this limits external validity, the objective of working with the role models was to inform a subsequent study phase to empower firefighters who self-selected as peer advocates. Despite this limitation, this type of intervention may be a promising way to change behaviour among firefighters and other populations with similarly pervasive social barriers.

The use of role models appears to be an under-utilised resource for addressing the numerous challenges to improving health-related behaviours in our current environment. SCT offers an explanation for how role models can promote behaviour change, and how they can be used effectively in interventions. If executed properly, the use of role models in a workplace setting has the potential to promote positive health behaviour changes and reduce the incidence and prevalence of chronic diseases. This case study illustrates how role models can help others make positive health behaviour changes that lead to the reduction of excess body weight and obesity-related co-morbidities. Interviews with the role models suggest that role models can play an important role in helping other firefighters increase self-efficacy, self-regulation and social support in the workplace. The role models reported that they believed their own positive health-related changes influenced co-workers.

While this study suggests that positive results can be achieved by using role models in workplace interventions, the authors hypothesise that the structural environment of a workplace is also important in helping support positive behaviour change. Workplace environments may provide barriers that ultimately reduce the effectiveness of role models in changing others' behaviour. Consequently, future research is needed to better understand the interaction between role models and the physical environment in workplace settings. Forthcoming data from the larger pilot intervention (Firefighter Food Intervention Research and Evaluation study) will provide some insights into the impact of the workplace environment.

Although the firefighting workforce is unique, it shares characteristics with other groups that work in close proximity, emphasise camaraderie and look to leadership for guidance. Thus, the theoretical framework and role model intervention presented here are applicable to a variety of workplace environments. The data from this case study suggest that employers should consider role model interventions as part of a comprehensive workplace wellness programme.

Declarations

Competing interests: None declared

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