



## Exploring implicit preventive strategies in prehospital emergency workers: A novel approach for preventing back problems



Marc Arial<sup>a,\*</sup>, Damien Benoît<sup>b</sup>, Pascal Wild<sup>c</sup>

<sup>a</sup> Federal Department of Economic Affairs, Education and Research EAER, State Secretariat for Economic Affairs SECO, Work and Health, Holzikofenweg 36, 3003 Bern, Switzerland

<sup>b</sup> Ergonomic, Planaz 29, CH-1807 Blonay, Switzerland

<sup>c</sup> Institut National de Recherche et Sécurité, Rue du Morvan, CS 60027, 54519 Vandoeuvre Les Nancy Cedex, France

### ARTICLE INFO

#### Article history:

Received 6 September 2012

Accepted 19 December 2013

#### Keywords:

Back pain

Emergency care

Prevention

### ABSTRACT

**Introduction:** Back problems are a major occupational health issue for prehospital emergency care professionals. The goals of this article are to: 1) provide descriptive data about the prevalence and the severity of lower back and upper back disorders in EMTs and paramedics; 2) identify some individual and collective strategies used by EMTs and paramedics to protect their health as they perform prehospital emergency missions; 3) assess the possible effectiveness of strategies in preventing back problems by exploring associations between the use of strategies and the presence and severity of symptoms.

**Material and methods:** The method includes a questionnaire survey (sample  $n = 334$ ; paramedics and emergency medical technicians) and ergonomics work practice analysis involving shadowing ambulance crews in 12 medical emergency services (over 400 h).

**Results:** A majority of ambulance professionals had experienced back pain in the twelve-month period before the survey. Work practice analysis revealed strategies and tricks of the trade used by ambulance professionals to reduce the chances of back strain while working. Multiple regression analyses showed that self-reported use of such strategies was associated with fewer back symptoms.

**Conclusions:** Preventive strategies should be integrated into specialised training programs for prehospital medical emergency professionals. This approach could also be used in other work settings.

© 2014 Elsevier Ltd and The Ergonomics Society. All rights reserved.

### 1. Introduction

There is evidence suggesting that occupational health problems are a major issue for emergency medical technicians (EMTs) and paramedics. For example, these professions have a high reported rate of retirement on medical grounds (Rodgers, 1998a) which may well be the consequence of deleterious working conditions. Musculoskeletal disorders (MSDs), chiefly chronic back pain, seem to be particularly prevalent in workers providing prehospital emergency care (Maguire et al., 2005). In EMTs and paramedics, they are the cause for 47% of early retirements on medical grounds (Rodgers, 1998b), affect a large proportion of ambulance professionals (Hogya and Ellis, 1990) and are a major reason for seeking medical help (Sterud et al., 2008). Strenuous tasks involving

adopting awkward postures, transferring victims from bed to stretcher, or lifting and carrying patients on stretchers, are everyday examples of the work done in these occupations (Doormaal et al., 1995; Lavender et al., 2000a, 2000b). Therefore, the onset of chronic MSDs often entails long absences and high risks of permanent work incapacity for the affected workers. Better understanding the issue of MSDs in EMTs and paramedics is crucial for developing, implementing and assessing the effectiveness of adequate preventive measures. However, recent literature reviews have concluded that little attention has been focused on this topic (Broniecki et al., 2010) and that most studies relied on small or convenient samples (Sterud et al., 2006) implying diverse potential selection biases. Therefore, comparative data about the prevalence and the severity of lower back and upper back disorders in EMTs and paramedics is clearly needed. Providing such data was one of the goals for our article.

Health consequences of deleterious working conditions are affected by diverse individual and organizational factors. The mechanisms which lead to these factors having protective effects are not clear and better understanding them might provide key knowledge for the prevention of MSDs. We believe that these

List of abbreviations: MSD, musculoskeletal disorders; EMT, emergency medical technician.

\* Corresponding author. Tel.: +41 31 323 8641; fax: +41 43 322 2119.

E-mail addresses: [marc.arial@seco.admin.ch](mailto:marc.arial@seco.admin.ch) (M. Arial), [dbenoit@ergonomic.ch](mailto:dbenoit@ergonomic.ch) (D. Benoît), [pascal.wild@inrs.fr](mailto:pascal.wild@inrs.fr) (P. Wild).

mechanisms might be identified through an examination of behavioral strategies developed by workers to best carry out their jobs. These strategies are a common concept in ergonomics and they refer to series of actions or behaviors used by workers to reach a specific goal (Faye and Falzon, 2009). In this article, we investigate the use of such smart practices by EMT and paramedics to protect their health in carrying out prehospital emergency missions, and we explore some quantitative and qualitative evidence supporting the effectiveness of these strategies.

In summary, the goals of this article are to:

1. provide descriptive data about the prevalence and the severity of lower back and upper back disorders in EMTs and paramedics;
2. identify some individual and collective strategies used by EMTs and paramedics to protect their health as they perform pre-hospital emergency missions;
3. assess the possible effectiveness of strategies in preventing back problems by exploring associations between the use of strategies and the presence and severity of symptoms.

## 2. Material and methods

We performed an occupational health study on a large sample of ambulance professionals. We invited all the EMTs and paramedics working in the French-speaking part of Switzerland to participate in a questionnaire survey and carried out a work practice analysis in ambulance services. Ambulance professionals in Switzerland are employed by hospitals, private services, or public agencies. Their work consists of the following: performing rescue operations; providing prehospital emergency care to patients requiring their assistance; and transporting patients to the hospital when necessary. They also perform other types of patient transport (e.g., from one hospital to another). Ambulance crews usually consist of two people, but missions occasionally involve medical teams (e.g., emergency physician and emergency nurse).

### 2.1. Questionnaire study

The target population and study sample have been presented previously (Arial et al., 2011). In summary, we contacted all 32 emergency medical care services in the French-speaking part of Switzerland. Twenty-seven services (84%) accepted the invitation to participate and provided the researchers with lists of the names and email addresses of their employees. Among the services which accepted to participate to the study, 44% were independent private services, 30% belonged to hospitals, and 26% were linked to diverse organizations (e.g., fire department, police, and airport emergency services). The questionnaire took approximately 45 min to complete. Questionnaires were sent to all ( $n = 669$ ) employees of those services. Participants who were not EMTs or paramedics were excluded from our analysis. Arrangements were made with the employers to allow their employees to answer the questionnaire during working hours (i.e., waiting time between missions). We offered the option of answering the questionnaire on paper or on-line. After completion paper questionnaires were returned by means of a prepaid envelope. When using the on-line version, participants had the opportunity to leave the session and log in again later without losing data entered during the previous session.

We used a French version of the Nordic Questionnaire (Dickinson et al., 1992; Kuorinka et al., 1987) to acquire the information on musculoskeletal symptoms. This questionnaire has been used in several professions such as nurses (Smith et al., 2004), computer users (Brisson et al., 1999; Bergqvist et al., 1995; Cook

et al., 2000), forestry workers (Hagen et al., 1998) or coopers (Macdonald and Waclawski, 2006). This questionnaire is repeatable, sensitive and appears to be appropriate as a screening tool (Crawford, 2007). It is also reported as a valid tool for monitoring diverse work-related MSDs in epidemiologic studies (Descatha et al., 2007; Perreault et al., 2008). We considered symptoms (pain or discomfort) affecting 2 anatomical regions: 1) lower-back, and 2) neck-shoulder-upper-back. Symptoms were assessed for duration and severity separately for each anatomical region considered. The rating procedure for the duration of discomfort/pain to both the anatomical regions considered is as follows: (0) no pain or discomfort in previous 12 months, (1) pain or discomfort experienced 1–7 days in previous 12 months, (2) pain or discomfort experienced 8–30 days in previous 12 months, (3) pain or discomfort experienced more than 30 days in previous 12 months. Severity: We choose not to use the standardized procedure included in the Nordic Questionnaire to measure the severity of symptoms. Instead, respondents reporting symptoms (pain or discomfort) to the lower-back region or the neck-shoulder-upper-back region within the twelve months before answering the questionnaire were asked to rate its peak episode on a scale ranging from 0 - “no pain at all” to 10 “unbearable pain”). This scale is well-known and widely used by EMTs and paramedics in Switzerland. It is particularly used as an aid to estimating the pain patients are suffering and whether to inject a quick-acting narcotic analgesic (i.e. Fentanyl). We choose this formulation because ambulance professionals who pretested our questionnaire spontaneously transcribed our formulation into their more usual one (0–10).

Strategies: respondents were asked whether they agreed with the following sentence: “With my work experience, I developed and learned some tricks of the trade helping me to spare my health”. The coding is as follows: (1) totally disagree, (2) rather disagree, (3) rather agree, and (4) totally agree. Answers (1) and (2) were grouped for the purposes of our analyses.

The survey also included a variety of other categories of questions (on mental health, effort–reward imbalance, types of mission, average weekly number of missions, etc.) covered in another article on the association of different stressors with mental health indicators in EMTs and paramedics (Arial et al., 2011).

#### 2.1.1. Statistical analysis

Descriptive statistics were used to describe participants' answers on demographics, self-reported symptoms and self-reported use of preventive strategies. The self-reported health outcomes (severity and duration of symptoms to lower-back and neck-shoulder-upper-back regions) were analysed using an ordered logistic regression, also called proportional odds model (ologit command in STATA) owing to the ordinal nature of these two variables. Ordered logistic regression generalizes logistic regression, in that the dependant variable is not binary but ordinal. The coefficients of this regression can also be interpreted as a summary of  $J$  logistic regressions if the dependant variable has  $J + 1$  possible outcomes (see for example Long and Freese, 2006). The parameters of ordered logistic regressions can therefore be interpreted as mean odds-ratios or log-odds-ratios, when dividing the dependant variable using the  $J$  different possible cutoffs. The main independent variable considered is variable coding the self-reported use of strategies for the prevention of back problems in three categories (rather disagree, agree, totally agree). These regression model were further adjusted on known determinants of back pain (gender, age and on professional category which were considered as a potential confounders). No post-hoc selection of covariables was applied. The analyses were performed with STATA software for Windows, release 12.0 (Stata corporation, College Station, TX, USA). For all statistical tests, an overall significance level was set at  $P \leq 0.05$ .

Download English Version:

<https://daneshyari.com/en/article/10365887>

Download Persian Version:

<https://daneshyari.com/article/10365887>

[Daneshyari.com](https://daneshyari.com)