



Occupational safety across jobs and shifts in emergency departments in Denmark



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ABSTRACT

This paper explores whether occupational safety and health (OSH) risk perceptions, behaviour and exposure differ among Emergency Department (ED) doctors, nurses and medical secretaries, and whether observed safe working conditions and behaviour in EDs vary across work shifts. Staff from four public hospital-based EDs completed a survey regarding safety climate, risk behavior, work pressure, exposure to and reporting of injuries, violence and threats. Furthermore, safety observations of working conditions (e.g. order and tidiness) and behavior (e.g. discarding hypodermic needles) were carried out during day, evening and night shifts. Rates of self-reported violence and threats in ED doctors and nurses were two to three times greater than rates seen for doctors and nurses at hospitals in general. However, ED respondents perceived a greater managerial focus on certain aspects of the safety climate. Work pressure and lack of time (among doctors and nurses) and social pressure (among medical secretaries) were the primary reasons given for taking OSH risks. If OSH incidents (e.g. injuries or violence) were not reported, it was often because the process was perceived as too laborious, and some incidents were considered 'part of the job'. Observations of order and tidiness in the EDs showed a gradual lower score in safety conditions from the day to the evening and night shift. Multifaceted and integrated interventions for educating and training ED personnel need to take into account their varying risk exposures, perceptions and behaviors in creating and sustaining an efficient, safe and healthy working environment.

1. Introduction

There is much political, practical and research focus on patient safety in hospitals (Dall'Ora et al., 2016; Sammer et al., 2010), whereas there is relatively less focus on the occupational safety and health (OSH) of hospital staff, particularly in European countries. Health care workers have significantly higher rates of musculoskeletal disorders than workers in other industries (Aslam et al., 2015), and needlestick injury is one of the most common injuries among healthcare personal (Motaarefi et al., 2016), leading to many direct and indirect costs (Mannocci et al., 2016). Workplace violence towards health care professionals is also prevalent, yet is known to be underreported, and is often perceived to be a 'part of the job' (Copeland and Henry, 2017; Ferns, 2005; Kowalenko et al., 2012; Taylor and Rew, 2011). Previous survey results on OSH in Denmark revealed that 7% of responding hospital employed doctors and 18% of nurses were exposed to physical violence, while 21% and 28% were exposed to threats of violence – within the last 12 month period (WEHD, 2014).

A positive workplace safety climate amongst leaders and employees has been found to be an important factor in preventing accidents at

work among health care workers (Bronkhorst, 2015; LLINPSF, 2013). In terms of hospital safety climate, hospital employees in the previous WEHD survey (2014) were relatively positive regarding their own prioritising of safety, but were more critical in terms of management's prioritising of safety – particularly when the work schedule was tight. Time and work pressure were two other issues in the WEHD survey, where hospital doctors and nurses generally perceived that they did not have enough time for carrying out their own job assignments. These results however, were very general for hospital workers, and did not differentiate between employees in different hospital departments, or type of staff e.g. doctors, nurses and medical secretaries found in the unique working environment of emergency departments (ED).

Hospitals are typically open and staffed around the clock, requiring organising work into various forms of shift-work (e.g. day-, evening- and nightshifts, extended shifts, rotating shifts) (Zhao et al., 2010). However, hospital shift work has been associated with a higher risk of work related injuries for nurses (Bae and Fabry, 2014; Gold et al., 1992). Likewise, rotating between day (evening) and night work has generally been associated with a higher risk of reported accidents and errors, higher accident risks, and higher reporting of near misses than

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employees who are not engaged in shift work (Gold et al., 1992; Zhao et al., 2010; Åkerstedt, 1998). In addition, shift work (and long working hours) has been associated with percutaneous injuries (e.g. needle-stick), and musculoskeletal symptoms amongst health care workers (Bae and Fabry, 2014; Rodriguez-Jareno et al., 2014; Zhao et al., 2010).

EDs have an unpredictable flow of patients, admitted with a wide range of unknown diagnoses, of varying severity, as opposed to other hospital departments that are mainly concerned with diagnosed out-patient treatment. Furthermore, there are elevated rates of intoxication and substance use among ED patients (Kowalenko et al., 2012). Acute admissions often need to be dealt with immediately, and staff need to constantly prioritize patient flow and the needs of the patients and visitors, while simultaneously taking their own and their colleagues' safety and health into account. If OSH incidents (e.g. injuries, violence, threats) occur to workers, not only do they have an undesired primary effect for the worker, but can secondarily also affect the patients, e.g. how quickly they will be treated (Wagstaff and Lie, 2011).

There is a lack of studies looking at the observable level of safety (working conditions and behaviour) in EDs across various work shifts, as well as how OSH risks are perceived and dealt with by the various job categories of ED employees, including medical secretaries (ED scribes or clerks). Medical secretaries in Denmark have both a clerical and administrative function based on four years of training, including basic training in anatomy, physiology, pathology, psychology, and law. Their work includes administering patient journals, attending to incoming patients, and helping doctors with practical work. They are often the front line staff that patients (and their accompanying persons/relatives/companions) initially meet upon arrival at an ED, and thus can have an instrumental role in proactively dealing with potential OSH issues that arise, e.g. violence and threats (Gillespie et al., 2016).

The main purpose of this paper is to explore and describe differential OSH risk perceptions, risk behaviour and risk exposure amongst doctors, nurses and medical secretaries in EDs. Secondly, to measure whether safety conditions (e.g. order and tidiness) and behaviour (e.g. discarding needles) in EDs vary across time of day (work shifts). The hypotheses are that the three ED job groups have dissimilar risk perceptions, behaviours and exposures, and that the level of safety (working conditions and behaviour) is independent of time of day (work shifts).

2. Materials and method

To explore OSH perception, behaviour and exposure in EDs, doctors, nurses and medical secretaries in four EDs were invited to participate in the current study. Other professions with only short periodic contact with patients, and who worked across more than one department were excluded, e.g. laboratory technicians, patient transporters, volunteers. Patient care technicians were initially included, but later excluded as there were too few employed by the EDs. All of the EDs were situated in public hospitals in Denmark, and were also training sites for doctors not yet permitted to practice medicine independently.

In 2014 the ED's had a total catchment population of approximately 1 million people, 1000 beds (10% allocated to EDs), and 50% of the in-patients were finalized in the EDs. Approximately half of the doctors were trainees. Three of the departments had recently started using new premises (< 5 years) in relation to renovations or rebuilding, while the fourth ED used older premises leading to smaller and potentially less safe conditions than the others (more precise descriptive data of the four EDs are not provided for the sake of anonymity) (MHP, 2014). The study was designed as a descriptive cross-sectional study, and involved two types of data sources: (a) a staff survey data, and (b) on-site observation data.

2.1. Study population

A convenient sample of four hospital-based EDs was recruited in

Table 1

Demographic survey data from the staff in four public hospital emergency departments.

	Doctors	Nurses	Medical secretaries
Invited, <i>n</i>	144	378	101
Participated, <i>n</i>	67	198	69
	(47%)	(52%)	(67%)
Female	55%	94%	100%
Age, mean rounded (<i>SD</i>)	37	43	43
	(10.7)	(11.1)	(9.6)
Tenure in years, mean rounded (<i>SD</i>)	1.3	6.2	4.8
	(1.9)	(6.7)	(3.8)
Respondents working shift work	82%	66%	87%

2016, in which the ED leaders and employee representatives agreed to the study. Contact persons at the EDs promoted staff participation in the study through a pamphlet and at regular staff meetings. A total of 54% of the 623 invited staff responded to the survey. The variations by job group in participation rates, sex, age, shift-work and tenure are shown in table 1. Respondents who answered less than two questions in the survey were excluded.

The high level of shift work (between 66 and 87%) among the three job groups, did not allow for stratifying the survey analyses across the three shifts. The doctors in the study were both younger and had less tenure than the nurses and medical secretaries. These are partly explained by the requirement for junior doctors to spend one year in supervised clinical education, consisting of two 6-month terms focused on separate medical themes, and in two different settings (departments or general practice).

2.2. Survey

The survey consisted of topics regarding: safety climate (respondents' perceptions of leaders' and workers' commitment and ways of dealing with OSH), risk taking, perceived work pressure, exposure to predefined forms of violence and threats in the EDs, and whether the staff reported OSH injuries or incidents. The questions were either adopted or adapted from existing validated surveys (Flin et al., 2000; Kines et al., 2011; Menckel and Viitasara, 2002; MHP, 2014; WEHD, 2014), or were created specifically for this particular context based on prior interviews and observations with ED personnel and other stakeholders. Some items required adaption to ensure their relevance to the particular respondents and settings. Therefore, the survey was not independently validated. Various relevant scales were used for each topic, with response categories varying from 'yes-no', 'agree-disagree' (4-point scale; perceptions and attitudes – no middle category; see Kines et al., 2011), to 'always-never' (5-point scale). Finally it was possible for informants to leave comments at the end of the survey.

In order to increase the reliability of the study, the survey questions regarding perceptions and attitudes were balanced with either positive, negatively or neutrally worded items. Furthermore, the front page of the survey was kept neutral, not pointing towards certain areas of interest besides the title 'Prevention of occupational accidents in EDs', to avoid some respondents feeling more inclined to respond than others. The respondents could fill out the survey either electronically or on paper during work or in their own time, without being supervised by the researcher or the employer, thus reducing responder bias.

Each ED contact person provided email addresses of the currently employed doctors, nurses and medical secretaries for the research team to send a web based survey (three EDs), and/or circulated personally addressed paper surveys with a stamped reply envelope (two EDs). Invited respondents from each ED were given up to four weeks to complete the survey, with each of the four week periods occurring between May and October 2016. Non-responders were given up to two reminders during the four week period.

Completed paper versions of the survey were scanned electronically,

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