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Associations of work characteristics, employee strain and self-perceived quality of care in Emergency Departments: A cross-sectional study

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ABSTRACT

Background: The individual and shared effects of adverse work characteristics on patient care in Emergency Departments (ED) are yet not well understood. We investigated the associations of self-reported ED work characteristics, work-related strain, and perceived quality of care.
Methods: Questionnaire-based survey with standardized measures among N = 53 ED professionals (i.e., nurses, physicians, and administration staff). The study was conducted in the interdisciplinary ED of a German community hospital.
Results: A high prevalence of work-related strain was observed: 66.0% of ED professionals showed high levels of emotional exhaustion and 55.6% showed irritation scores above the cut-off value. ED staff reported high supervisor support and autonomy, paired with high time pressure and patient-related stressors. Multivariate analyses revealed that high time pressure and low supervisor support were associated with high work-related strain. Low staffing was related to inferior quality of ED care.
Conclusions: ED work systems involve high competing demands for ED professionals with substantial risks for work-related strain. Moreover, adverse ED work characteristics comprise risks for high quality patient care. Our results suggest that promoting work characteristics might foster ED staff functioning on the job as well as improve ED patient care.

1. Introduction

Patient safety and quality of care in emergency medicine are repeatedly in the center of scholarly attention [1]. Among the sources of diminished quality of care that have been recognized in Emergency Departments (ED), high demands and challenges of the work system are particularly relevant [2,3]. ED work is associated with a high potential for work-related stress which contributes to strain as well as diminished quality of care [4,5]. However, the role of these factors in augmenting or mitigating risks for patients is still not well understood [1].

EDs impose high demands on professionals, especially during periods of high pressure [6,7]. A plethora of work demands on various levels exist [3,7]. On the organizational level, demands encompass coordination and communication problems, lack of teamwork, disruptions/interruptions, and staff shortages [6,8]. On the social level, verbally and physically aggressive patients and their relatives have been mentioned [6,9]. On the task level, competing demands, short timelines (i.e., targets for length of stay), communication overload and highly variable workloads were identified [6,10]. Leadership and supervisor support have been acknowledged as important resources in dealing with stressful workloads and client interactions [6]. Nevertheless, ED work can also be perceived as inspiring and challenging with regard to teamwork, communication and unique opportunities to obtain vital technical and non-technical skills [6].

To capture the complexity of ED work and its effects on employee and care outcomes, studies that capture contextual as well as employee factors are necessary [1,11]. Adverse work characteristics are hazards to ED professionals' functioning on the job as well as to quality of care [12,13]. Therefore individual and shared effects of ED work characteristics on employee strain and quality of care deserve consideration [14]. To the best of our knowledge, prior studies did not address yet the individual as well as the shared effects of contextual and employee factors for ED quality of care.

We set out to simultaneously investigate the associations between multiple contextual characteristics of ED work, employee well-being and quality of care [1,15]. Using a cross-sectional survey methodology, we attempted to answer the following questions: What are the associations between ED work characteristics

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and ED professionals' strain and self-perceived quality of care? To what extent do work characteristics moderate the association of employee strain and quality of care in EDs?

2. Materials and methods

2.1. Design and setting

A cross-sectional survey was conducted in the ED of an urban hospital in Southern Germany, which operates 24 h and is staffed with surgical and internal medicine clinicians. It serves 16.600 patients per year. In regard to size, patient census, work organization, staffing levels, and technological provisions, this ED is comparable to the majority of EDs in Germany [16,17].

Hospital-based emergency medicine in Germany differs from the Anglo-American model in some respects. Increasingly, interprofessional, centralized EDs are implemented (like at our study site). There is no ED specialty certification for physicians in Germany, thus physicians often rotate temporarily from other hospital wards to the ED. Only a few physicians are permanently allocated to EDs. Due to the broad services of practice-based general practitioners (GPs) and specialists, patients are requested to firstly make use of GP consultations before entering ED care. However, utilisation of EDs has increased steadily. The vast majority of patients in Germany are enrolled in a statutory or private healthcare insurance. Both types of insurance cover urgent emergency care and hospital treatment.

In our study, we used a convenience sample. The reported survey was part of a project on ED staff well-being and quality improvement. The Ethics Committee of the Medical Faculty at the Ludwig-Maximilians-University Munich approved the study (NR 406-11).

2.2. Procedure and sample

All 86 staff members of the studied ED, i.e., physicians, nurses and administrative officers, were eligible for participation. Paper questionnaires with an enclosed information letter and consent form were distributed. Completed questionnaires were sent directly to the research team. Altogether, 86 questionnaires were distributed to 21 nurses, 51 physicians and 14 administrative officers working in the ED. Fifty three questionnaires were returned representing a response rate of 61.6%.

2.3. Variables and measures

Sociodemographic measures included profession (nursing, physician, administration), job tenure (in years), and type of work contract (1 = full-time, 2 = part-time). Furthermore, average weekly overtime during the past month was inquired.

Ed work characteristics were measured with a validated self-report instrument for work analysis in hospitals [18]. It is a well-established instrument in Germany to evaluate health professionals work environment. Permission for use was granted by the authors. Five specific psychosocial work characteristics are investigated. The selection of measures was not based on a theoretical model. All scales ranged from 1 = no, not at all to 5 = yes, to a great extent. *Supervisor support* was measured with three items (e.g., "My direct supervisor provides clear feedback on my work performance"). *Staffing* was measured with one item ("Staffing in this ED is adequate"). *Time pressure* was measured with two items (e.g., "I often have too much work to do at once"). *Patient-related stressors* were measured with two items (e.g., "Care for multi-morbid patients is repeatedly burdening"). *Autonomy at work* was measured with a three-item scale drawn from the German version of the Work-Design-Questionnaire [19]. An example item is "The job allows me to decide on the order in which things are done on the job".

ED professionals' work strain: The concept of irritation provides a useful measure of short-term changes in mental states related to work stress. It was measured with a six-item scale upon approval by the authors [20]. An example item is "Even at home I can't stop thinking about problems at work". Items were answered on a seven-point scale ranging from 1 = strongly disagree to 7 = strongly agree. ED professionals' emotional exhaustion was measured with a three-item scale from the German version of the Maslach Burnout Inventory [21]. An example item is "I feel burned out from my work". A frequency scale was applied from 1 = never to 6 = very often. Cut-offs to categorize ED professionals as having high or low work strain are based on normative classifications, where values above the scale means of irritation (M, Mean > 3.10) and emotional exhaustion (M > 3.5) are indicative of high work strain [22,23].

Quality of care: Before the start of the study, important quality of care indicators were identified in collaboration with the local department heads. Four major quality aspects were operationalized in the questionnaire (with the introductory question: "How do you rate the following aspects in this ED?"): (1) Internal patient transfer from the ED to hospital wards/ICU/ORs, (2) Quality of patient care in the ED?, (3) Length of stay in the ED?, (4) Quality of care in patients with extended lengths of stay? All four items were rated on a scale from 1 = very bad to 5 = very good.

2.4. Statistical methods

Descriptive analyses of study variables were computed for the overall group and for each ED profession separately. Mean differences were tested via analyses of variances. Subsequently, linear bivariate and multivariate regression analyses were conducted to determine individual and shared associations between ED work characteristics and work strain as well as self-perceived quality of care as outcome variables. All associations were controlled for type of work contract since exposure to work stressors is decreased in part-time work. Finally, moderation analyses were calculated. All possible combinations of different work characteristics and work-related strain were modelled to determine healthcare professionals' perceptions of quality of care as an outcome variable.

Prior to the main analyses we tested the psychometric reliabilities of our scales, which turned out to be satisfactory for supervisor support: $\alpha = 0.78$, time pressure: $\alpha = 0.82$, patient-related stressors: $\alpha = 0.77$, autonomy: $\alpha = 0.67$, irritation: $\alpha = 0.87$, exhaustion: $\alpha = 0.91$, and quality of care: $\alpha = 0.65$ [24]. Validity of our quality of care measure was established through an exploratory factor analysis (EFA, using orthogonal rotation, Varimax). Results suggested that all four quality of care items clustered into one single factor. All analyses were carried out with SPSS (23.0).

3. Results

Data were collected from 53 ED professionals: 29 physicians (54.7%), 13 nurses (24.5%), and 11 administration officers (20.8%). Forty one participants (77.4%) were working full-time while 11 worked part-time (20.8%; 1 missing value). Part-time employees were working M = 19.9 h per week (SD = 12.2). As Table 1 shows, nurses reported significantly higher job tenure than physicians and administration staff. Physicians reported significantly higher numbers of overwork hours compared to nurses and administration staff. For the overall group, we observed that two third of the participants reported emotional exhaustion above the cut-off value of M > 3.5 (n = 35, 66.0%); with the highest share in