International Journal of Nursing Studies 75 (2017) 43–50

Contents lists available at ScienceDirect

International Journal of Nursing Studies

journal homepage: www.elsevier.com/locate/ijns

How does emotional exhaustion influence work stress? Relationships between stressor appraisals, hedonic tone, and fatigue in nurses' daily tasks: A longitudinal cohort study

Jordi Fernández-Castro[a,*], Fermín Martínez-Zaragoza[b], Tatiana Rovira[a], Silvia Edo[a], Ángel Solanes-Puchol[b], Beatriz Martín-del-Río[b], Rosa García-Sierra[c], Gemma Benavides-Gil[b], Eduardo Doval[d]

[a] Departament de Psicologia Bàsica, Evolutiva i de l'Educació, Universitat Autònoma de Barcelona, Barcelona, Spain
[b] Departamento de Psicología de la Salud, Universidad Miguel Hernández, Elche, Spain
[c] Consorcio Sanitario de Terrasa, Terrasa, Spain
[d] Departament de Psicobiologia i de Metodologia de les Ciències de la Salut, Universitat Autònoma de Barcelona, Barcelona, Spain

ARTICLE INFO

Keywords:
Burnout
Control
Demand
Ecological momentary assessment
Emotional exhaustion
Ward nurses

ABSTRACT

Background: Work-related stress is a prevalent condition in the nursing profession, and its influence may vary according to changeable individual and situational factors. It is, therefore, important to investigate the real-time momentary changes in these factors and their relationship to emotional exhaustion experienced by nurses.
Objectives: We aim to analyse how their perceptions of demand, control, effort and reward change according to the task performed through real-time assessment and interact with the emotional exhaustion level of ward nurses.
Design: The research design was longitudinal.
Method: A three-level hierarchical model with a repeated measures design was used to assess the momentary self-reports of 96 hospital ward nurses, completed using a smartphone programmed with random alarms.
Results: Findings show that demand, effort, and control appraisals depend on the task performed. The task appraised as most demanding, effortful, and controllable was direct care. Reward appraisal depends on the task performed and personal variables, i.e. emotional exhaustion. The situations perceived as more rewarding were rest and direct care. Momentary hedonic tone can be explained by the task performed, demand, reward, emotional exhaustion and by the interaction between emotional exhaustion and demand appraisal. Momentary fatigue can be explained by the task performed, demand, reward, and the emotional exhaustion.
Conclusions: This study highlights the importance of using momentary measures to understand complex and changeable inter-relationships. While also clarifying the targets of intervention programmes aimed at preventing burnout within the nursing profession.

What is already known about the topic?

- Stress, emotional states and fatigue in ward nurses depend on changes that occur from moment to moment along the shift.
- Studies using ecological momentary evaluation have shown that direct care tasks are the most stressing.
- Moreover, momentary emotional state can be predicted by the appraisals of demand, effort, control and reward of the task performed, and that fatigue can be predicted by the control and reward appraisals of the task performed.

What this paper adds

- The perceptions of demand, effort, control, and reward depend mainly on momentary task; however, the perception of reward is also negatively influenced by personal factors, as emotional exhaustion.
- Hedonic tone is influenced by momentary variables, such as appraisal of demand and reward, and by personal variables such as emotional exhaustion and years of experience. Furthermore, an interaction between personal and momentary variables has been found, since a high level of emotional exhaustion leads the appraisal

* Corresponding author at: Facultat de Psicologia, Carrer de la Fortuna, 08193 Bellaterra (Cerdanyola del Vallès), Spain.
E-mail address: jordi.fernandez@uab.es (J. Fernández-Castro).

http://dx.doi.org/10.1016/j.ijnurstu.2017.07.002
Received 27 February 2017; Received in revised form 30 May 2017; Accepted 2 July 2017

of demand to influence hedonic tone even more.
- Fatigue is influenced by momentary variables such as appraisal of task demand and reward and by personal variables as emotional exhaustion.

1. Introduction

Workplace stress is notoriously prevalent in the field of nursing and is associated with high levels of staff burnout (Greenglass et al., 2001; Estryn-Béhar et al., 2010), decreased job satisfaction (Zangaro and Soeken, 2007), decreased commitment to the institution (Cho et al., 2006), and safety violations (Aiken, 2002; Gerend et al., 2004; Fogarty and McKeon, 2006). To be exact, the term burnout is used to describe an individual condition related to chronic stress at work characterized by emotional exhaustion, depersonalization and a decline in personal accomplishment (Maslach et al., 2001). It has been claimed that workload is most directly related to emotional exhaustion defined as a feeling of excessive emotional stress and feeling drained from contact with other people (Maslach et al., 2001). Moreover, it has been stated that the core element of burnout is emotional exhaustion, and that it is the first dimension leading to burnout (Maslach et al., 2001; Kowalski et al., 2010; Günüşen et al., 2014).

The Job Demand-Resources model (Bakker et al., 2014) explains how burnout depends on the balance between job demand and the resources to cope with these demands. However, as Bakker et al. (2014) have pointed out, the challenge in researching workplace stress now lies in identifying daily fluctuations in stress levels in order to determine how far these changes depend on the nature of the task or on an individual's ability to cope with the situation.

Ecological Momentary Assessment can be thought of as a group of techniques that gather data regarding participants' behaviour and experience while in their natural environments and on a real-time basis (Shiffman et al., 2008; O'Connor and Ferguson, 2008). This method provides high ecological validity, and as assessments are completed in real-time, the risk of potential recall bias is reduced. It is also considered effective in gathering information regarding daily fluctuations in workplace stress; this is because, as Molenaar (2004) pointed out, the effective testing of psychological theories requires that not only should the variations between individuals be accounted for, but so should those within individuals, which Ecological Momentary Assessment is particularly effective for.

Ecological Momentary Assessment is specifically suitable for evaluating nurses with respect to how far changes in task demand or resources result in differences in work stress, modelling together within and between individual influences, which can lead to a more complete explanation of the process, as well as a more ecological understanding of what happens in the real world. Through this effective method using diaries and traditional questionnaires, Johnston et al. (2006) assessed trained nurses' momentary self-report of perceived task demand, control, effort and reward. This study, therefore, demonstrates how momentary diaries could be a powerful and flexible way of assessing work related stress and its putative determinants in a real life work setting due to their sensitivity to short-term changes in the variables chosen for the study.

Shively et al. (2011) applied Ecological Momentary Assessment data collection to 119 registered nurses over a timescale of one week. The nurses were required to report their work activity, perceived workload and subsequent stress level at 90 min intervals. Results revealed that as the number of patients assigned to an individual nurse increases, so does the nurse's reported stress level. Interestingly, it was found that nurses' age and gender along with their familiarity with the patients, proportion of direct care tasks, and whether the facility was adult or paediatric did not significantly predict nurses' momentary stress. Johnston et al. (2013) used the same methodology in order to study the relationship between task demand/effort, control and reward together with nurses' changeable positive and negative mood. Their main findings were that negative affect in nurses was highest at moments of high task demand/effort together with low control and low reward; in addition control and reward moderated the effects of demand/effort. In contrast, high positive affect was linked to moments of high task demand/effort and also high control and reward. This study was based on both Karasek's Demand – Control model (Karasek et al., 1998), and on Siegrist (1996) Effort – Reward imbalance model. These occupational stress models have been widely tested for comparison between individuals (Gilbert-Ouimet et al., 2014). The study by Johnston et al. (2013) reached the conclusion that they can also be applied to explain variations within the individual over the working day. Johnston et al. (2016) made a real-time comparison between nurses of the psychological and physiological effects of workplace stressors in each individual nurse and the nurses' appraisals of these stressors. Physiological measures included changes in heart rate and the psychological measures perceived were tense-arousal, hedonic tone and fatigue. As well as that, the task being performed at the time was also measured as it was considered a momentary stressor. Findings suggested that heart rate was associated with both demand and effort, while perceived tense arousal was related to demand, control, effort and reward. Hedonic tone was also linked to demand and control, and finally, fatigue was shown to be related with control and reward. Surprisingly in this study, task demand and perceived task effort had no fatigue effect. However, decreases in fatigue and increases in the nurses' positive affect were evident when appraisals of self-control were high. In terms of Job Demand – Resources model, fatigue appeared related to resources, whereas hedonic tone depended on job demand; and perceived tense arousal was related to both kinds of variables. It was found that some nursing tasks are perceived as more stressful than others, with nurses reporting more stress during episodes of direct care than with any other task type.

Nevertheless, in a systematic review of research about the relationships between work-related stress, workplace burnout, job satisfaction and the general health of nurses, Khamisa et al. (2013) identified contradictory evidence of the causality between these measures, which indicates that there is a need for further investigation. The data reviewed above can open up a new way to analyse causality of work-related stress in nurses. Returning to the concept of emotional exhaustion, presented at the beginning, information provided by self-report questionnaires in cross-sectional studies shows that emotional exhaustion could be a state that links workload stress and burnout and low job satisfaction. However, it has very little information about how emotional exhaustion influences everyday activities in nurses. Although emotional exhaustion is a general condition which prevails over time when it is measured by questionnaires, we believe that it does not have the same influence in all situations. Emotionally exhausted nurses could be more reactive to situations related specifically to demand, showing more fatigue and more negative hedonic tone.

2. Aim

The aim of this study was to explore the relationship between emotional exhaustion and the momentary events occurring during the daily shift.

Firstly, we hypothesized that nurses with higher emotional exhaustion should appreciate: (1) more demand, (2) more effort, (3) less control, and (4) less reward than nurses with low levels of emotional exhaustion under equal conditions. This influence would be stronger in direct care tasks, as illustrated by Johnston et al. (2016), who found that this was the most stressful task for nurses.

Secondly, we also hypothesized that hedonic tone would be more negative through the shift and would be influenced by demand and effort momentary appraisals, emotional exhaustion and its interaction, which is consistent with the results by Johnston et al. (2016) that related hedonic tone with job demand factors.

Thirdly, we hypothesized that fatigue would increase through the