

Abstract of Contribution 792

ID: 792

4. Worktime arrangements and Work-Family Interface

Submission Type: Position Paper

Topics: 4.1. Work time arrangements

Keywords: Fatigue, self-report, behavioral markers, psychophysiological data, organizational neurosciences

Integrative perspectives of occupational fatigue Contributions from organizational neurosciences

Teresa C. D'Oliveira

ISPA - Instituto Universitário, Portugal

State of the Art

In spite of the applied relevance of occupational fatigue to a variety of activities and industries, a consensus and rigorous definition of the concept still has to be formulated (Matthews, Desmond, Neubauer & Hancock, 2012). Hockey (2011) extends this view and argues that despite the work developed in the last 100 years, a consolidated theory of fatigue, its origins and functions has yet to be proposed.

This paper considers occupational fatigue as the fatigue resulting from work activities (i.e., work activities which main components involve physical and psychological processes) and the working conditions under which these are performed (e.g., working conditions, temporal organization, workload, work rhythms) .

The variety of antecedents and mediators of occupational fatigue may help to understand the paradoxes associated with the topic. The paper will organize previous research in three main areas: Sleep deprivation, sleep disturbances and activities performed.

Sleep deprivation regards the number of hours slept in the last 24 hours and is associated with concepts as sleep debt, chronic and acute fatigue as well as a variety of consequences as sleepiness, somnolence or drowsiness. Regardless of the concepts adopted, research highlights the individual consequences of work schedules and, in particular, night work.

Although sleep disturbances result from changes introduced in the sleep cycle, the literature has demonstrated the repercussions in other circadian rhythms such as the endocrine systems. From the operational perspective, research has underlined that these disturbances are no longer restricted to shift work but are a direct result of the 24 hour society where long working hours appear to characterize the working population (D'Oliveira & Marques, 2009; D'Oliveira, 2011).

Research on the activities performed has suggested the relevance of a variety of factors such as job control and autonomy (Karasek, 1979) or monotony and complexity (Harrison & Horne, 2000).

The appealing nature of the topic has stimulated research in a variety of disciplines such as biology, medicine, psychology, management and neurosciences. Although the diversified scientific inputs are most welcomed, the integration of results and its incorporation in applied countermeasures has yet to be materialized.

The evaluation of occupational fatigue is divided in two main disciplinary approaches: biological sciences and social/psychological approaches. Although both consider data from work schedules, (i.e., night work, regular schedules, duration of a working, early starts), biological sciences center their research on physiological measures as cardiovascular activity and responses from endocrine systems while social/psychological approaches base their studies on self-reporting measures as *Fatigue Scale* (Chalder et al, 1993), *Fatigue Assessment Scale* (FAS) (Michielsen et al, 2004) or the *Checklist Individual Strength* (CIS) (Bültmann et al, 2000).

As a result, occupational fatigue is associated with a fragmented and disciplinarily biased state of the art.

The paper will also consider the few exceptions to such theoretical background as the Model of Compensatory Control by Hockey (1997, 2011) where both physiological and psychological approaches are considered in the regulation of individual effort. According to the model, effort is at least partially under the control of the individual and may be increased by task interest, task engagement, reward system or the negative consequences of performance decrements. The study and monitoring of these factors is instrumental in the understanding of the physiological and psychological markers of occupational fatigue.

New Perspective/Contribution

Following the presentation of the state of the art and a critical analysis of the multidisciplinary literature on fatigue, the paper discusses the potential contributions of organizational neurosciences. By combining psychological, behavioral and physiological approaches, the paper proposes an integrative approach to occupational fatigue that may help to understand behaviors and physiological changes and the potential compensatory or buffering factors in the working population.

Three main propositions will be considered:

1. Integrative approach of occupational fatigue

The literature on fatigue may be describe as fragmented with controversial definitions and models that result in incoherent, divided and scientifically biased perspectives. The paper proposes that the integration of multidisciplinary approaches is instrumental in the development of effective mitigating strategies.

2. Consilience in the evaluation of occupational fatigue

A variety of markers has been adopted in the study of occupational fatigue namely subjective behavioral reports, sleep logs, work schedules, endocrine changes, and cardiovascular activity, among others. The paper proposes that consilience or agreement in the identification of markers is central to the development of an integrative model of fatigue. In this regard, it is proposed that organizational neurosciences may provide a substantial contribution.

3. Integrated mitigating strategies

Finally, fatigue modeling systems have been proposed in several high reliability environments as the aviation industry. However, such approaches only consider the consequences of sleep deprivation and disturbances. Although research has identified a variety of antecedents, the benefits of these mitigating strategies are constrained by their restricted conceptual approach to occupational fatigue. As proposed by Smith (2011) the development of effective auditing instruments or methodologies must incorporate a variety of markers and cannot be restricted to potential disturbances of circadian rhythms.

The paper adopts a multidimensional approach to fatigue that involves both physical and psychological fatigue. In order to capture the multiple repercussions of fatigue, it is proposed that a variety of markers has to be adopted that includes subjective reporting measures (e.g., CIS - Checklist Individual Strength), behavioral records (e.g. alertness, memory and vigilance data) and psychophysiological indicators (e.g., endocrine markers as cortisol and melatonin, and cardiovascular activity).

The buffering effect of working conditions (e.g., teamwork) or the compensatory effect of task characteristics (e.g., task engagement) need to be considered in order to fully understand occupational fatigue.

It is this integrative approach to occupational fatigue that may contribute to the development of effective mitigating strategies thus contributing to healthier work organizations.

Conclusion and Implications for Research/Practice

The integrative approach to occupational fatigue has clear implications for research and practice. By framing occupational fatigue within organizational neurosciences, the model presented proposes the integration of distinct disciplinary traditions and the combination of markers (i.e., subjective, behavioral and physiological). As a direct consequence, the integrative nature of the model strongly contributes to an increased operational validity of mitigating strategies.

Expected Audience

30-60 persons