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Do the work stress factors of women telephone operators change with the shift schedules?

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Abstract

The work stresses of women VDT-cum-telephone operators ($N = 136$), including the effects of permanent (day, evening and night) and rotating shifts on the behavioral responses and health disturbances were examined. The operators responded to an ergonomics checklist on work system analysis (e.g., job characteristics, physical and psychosocial stresses of work, workplace constraints, musculo-skeletal and visual strains, environmental hazards, and operator–VDT and telecommunication equipment interaction). The effects of shift schedules on health and well being were examined using questionnaires on sleep quality and quantity, physical health symptoms, chronic fatigue, cognitive and somatic anxiety, social and domestic disruption, composite morningness score, circadian type inventory (languidness and flexibility) and Eysenck personality inventory. The principal component factor analysis of the ergonomics checkpoints yielded five aspects of work. Factor 1 (organizational) describes job design needs, workplace interventions and constraints of VDT workstations. Factor 2 (environmental) covers illumination, climate and noise-related hazards. Factor 3 (mechanistic) refers to job specialization, pace of work, information handling, etc. Factor 4 (perceptual and motor) describes visual and auditory displays and controls. Factor 5 (motivational) refers to personal job characteristics and core dimensions, such as job autonomy, task significance and recognition. Factors 1–3 represented 45% of the total variance; Factors 4 and 5 represented 19% of the total variance. Long hours of seated work resulted in musculo-skeletal strains, however, the evening and night shift operators had highest back-related complaints (45–48%), compared to those in the day (28%) and rotating shifts (34%). The operators in the rotating and permanent night shifts had higher prevalence of visual strain. The loading of the work stressors explained in Factors 1–3 appeared autonomous, irrespective of the shift schedules. ANOVA and Tukey's HSD test indicated that the operators in the rotating shift had greater sensitivity to the stressors related to Factor 4. While the day shift operators responded greater to the stressors related to the core job dimensions that reflect growth needs (Factor 5), the night shift operators were less responsive to those dimensions. The scores on sleep disturbance, flexibility to sleeping habits and personality dimension (neuroticism) were negatively correlated to Factor 1. The digestive problems, social and domestic disruption and languidity dimensions were positively correlated to Factors 4 and 5. As noted in case of the rotating shift, the increased demand in the perceptual and motor, and the motivational aspects of work caused greater negative influence on physical health symptoms, and social and domestic disruption. The somatic anxiety was greater among women in night work. Findings of the multiple aspects of work supported that the behavioural response to the work stressors, and health and well-being dimensions did vary with the shift schedules. The job design interventions tailoring to the type of work and workplace ergonomics might improve the work stressors. The overlapping schedules of the rotating shift, including night work are the documented risk factors. Delayed morning shift for the operators in

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the rotating shift and adjustment of shift length based on the work and climatic load (e.g., reduce work hours in the evening shift to avoid peak workload, extend work hours in the day shift during the extremely hot summer months) might alleviate work stresses and enhance health and well-being.

Relevance to industry

Macroergonomic analysis of work in the telecommunication sector elucidates the multiple aspects of work stressors, including the shift schedules. In the light of cumulative health effects of the women VDT-cum-telephone operators, the study explores intervention and management of work to alleviate work stresses and enhance health and well being of the people involved.

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Keywords: Women VDT-cum-telephone operators; Work system analysis; Shiftwork; Aspects of work; Health and well being dimensions

1. Introduction

Employment of a significantly large number of women in the telecommunication sector as telephone operators is a worldwide phenomenon. In the recent years, dramatic changes have taken place in the sector—the conventional workplace arrangement and traditional office organization are not compatible with the modern work environment (e.g., VDT workstations, instructions and procedures, physical environment, the activities carried out, material interfaces, operator–equipment–environment–customer interaction). While the extent of the changes depends on the organization and the transitional state of technology implementation, the nature of impact of the changes on the workers' perception of work, and health and safety (Selvamurthy et al., 1996) might largely depend on the psychosocial context of the working environment. These concerns have become relevant in the technologically emerging societies, like in India, due to the need of the workforce for re-learning to the new work methods and practices. The objective changes in the work environment and compulsions of the workforce for their dependence on diverse work schedules may cause cumulative effects on health and performance (Liao and Drury, 2000; Tucker et al., 1996; Aaras, 1996; Aaras et al., 2001; Yaginuma et al., 1990). Therefore, one of the ongoing concerns of the telecommunication industry is to mitigate the effects of changed work characteristics and irregular work schedules on the ultimate outcome variables, e.g., work perfor-

mance, reliability, satisfaction, health and comfort (Rousseau, 1997). The current study examines how various work stressors and shiftwork schedules interact, in relation to long term combined effects of shift schedules on the health and performance of women VDT-cum-telephone operators in the telephone exchanges. It is noted that the study allowed examining four different shift systems (permanent day, evening, night and rotating shifts) for the same job.

2. Method

One hundred and thirty six women VDT-cum-telephone operators, who were assigned primarily in services like directory and information services, national/international trunk booking, and fault repair services in the local telephone exchanges at Ahmedabad, participated in the study. The operators were grouped as—permanent day shift (08:00–15:20, 10:30–17:50), permanent evening shift (16:40–00:00), permanent night shift (00:00–07:30) and weekly rotating shift, with average work duration of 7.33 h (44 h/week). About 48% of the operators studied were in weekly rotating shift, including night work, and the remaining half were distributed in other shifts—day (29%), evening (16%) and night (7%). The operators in the weekly rotating shift spread over seven overlapping shifts—morning (06:30–13:50 and 08:00–15:20), day (10:30–17:50 and 12:30–19:50), evening (16:40–00:00) and night shifts (00:00–07:30). The available information indicated that the shift

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