

Examining the effects of an office ergonomics intervention on computing behaviors, musculoskeletal health, culture and performance

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Abstract. An office ergonomics intervention incorporating a macroergonomics design approach was conducted to investigate the effects of a flexible workspace design and ergonomics training on musculoskeletal health, psychosocial environment and performance in a computer-based office setting. This longitudinal, field intervention study included three data collection periods (one pre- and two post-interventions). Knowledge workers were assigned to: flexible workspace (n=121), flexible workspace + ergonomics training (n=31), or control (n=45). The study findings indicated positive, significant effects on the outcome variables for the two intervention groups compared to the control group, including reduced musculoskeletal risk, symptoms and improved psychosocial environment and performance.

Keywords. Office ergonomics, intervention, performance.

1. Introduction

To mitigate adverse musculoskeletal health trends and enhance work effectiveness, organizations are redesigning physical workspaces and providing ergonomics training. The study aim was to conduct a macroergonomics intervention consisting of flexible workspace design and ergonomics training to examine the effects on computing behaviors, musculoskeletal health, psychosocial work environment and work effectiveness in a computer-based office setting. Emphasis was placed on participation of workers in the workspace design process, including enhancing individual's control over their work environment. This sense of control allows workers to influence decisions about where and how they might work, leading to improved physical health and performance. Such training can integrate ergonomics into an organization by linking the corporate goals with ergonomic practices, as well as providing employees with the knowledge on how they should arrange their workspaces to promote healthy computing habits and reduce musculoskeletal risk (Robertson et al., 2008).

2. Methods

This field intervention study consisted of: 1) new flexible office workspaces, and 2) training that encouraged the employees to exert control over how to use the workspaces. A quasi-experimental design was used where knowledge workers were assigned to one of three conditions: flexible workspace (n =121), flexible workspace+ergonomics training (n = 31), and a no-intervention control (n =45). Pre- and post-intervention work environment

and health surveys were administered (2 months prior to and 3, 6 months post-intervention) and observations (two months prior to and 6 months post-intervention) were conducted rating how individuals set up their workstation, and their working body postures (Robertson et al., 2008; Lueder & Corlett, 1996; McAtamney & Corlett, 1993).

3. Results

Overall, the study results found positive, significant effects on the outcome variables for the two intervention groups compared to the control group, including musculoskeletal health, job control, environmental satisfaction, sense of community, ergonomic climate, communication and collaboration, and business process efficiency. Observational results showed that the two intervention groups significantly improved their working postures and computing behaviors compared to the control group. The workspace+ergonomics training group revealed a significant difference from the workspace-only group indicating that they were more likely to appropriately set-up their workspace which positively influenced their computing behavior and postures, leading to a significant reduction in musculoskeletal risk and improved performance. These results are similar to the findings reported by Amick et al., 2003; Robertson et al., 2009. Those individuals who expressed a high sense of community were observed to have lower postural and musculoskeletal risk and improved computing behaviors.

4. Discussion and Conclusion

Our findings suggest that providing workers with control over their work environment through flexible workspace design and training appears to be paramount to optimizing performance, safety and health outcomes, especially in complex computer-based environments used by knowledge workers. The results of this study also show that optimizing workspace design to support group and individual work along with ergonomics training can significantly reduce business process times and related business process costs to the organization. This study highlights the importance of enhancing worker's control over their environment and contributes to the knowledge base of office ergonomics intervention research (Brewer et al., 2006). Applying a macroergonomics approach to designing office work environments can produce beneficial health and performance results for knowledge workers.

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