

Decreasing workload among construction workers with the use of four equipment

Kaukiainen Anneli, Sillanpää Jarmo, Lappalainen Jorma, Viljanen Matti, Nyberg Mika.
Tampere Regional Institute of Occupational Health, PO BOX 486, FIN 33101 Tampere

Physical demands are emphasized in particular in lifting, which drastically loads the musculoskeletal system. Lifting and carrying are manual work for construction workers, and the loads often exceed the recommended limits. Every fifth construction worker has experienced musculoskeletal disorders and symptoms, and disorders and symptoms increase with age. The objective of this study was to determine whether four pieces of equipment for cutting moulding, cutting reinforcement rods, carrying carpet rolls and fitting drain pipes can lighten the work load of construction work. Cutting moulding with the old method was done by squatting, but with the new method was the worker able to stand when working. Cutting reinforcement rods with the old method was done in a forward bent posture and with the new method the worker could stand with his back straight. The lifting and carrying carpet rolls is very demanding for the back. The new method was easy to use: no bent back postures, no lifting with hands. With the old method of fitting drain pipes the worker's back was bent, and with the new method he could stand straight and lift with the strap.

The participants in the study were healthy construction workers (n=39) with a normal work ability and functional capacity). Their mean age was 39 (range 23-54) years. Their work phases were videotaped and then analysed with the Ovako Working Analysis System (OWAS) and their heart rate was monitored during their work. With the aid of a questionnaire the men's' opinion about their work load was asked before and after the ergonomic improvements and the usefulness of the equipment was also inquired about.

The results indicate that the effect of using the new ergonomically designed equipment was positive, especially the cutter for reinforcement rods proved to be useful. Bent back postures decreased 11%. The use of bent back postures decreased during the cutting of moulding and the carrying of carpet rolls and the fitting of drain pipes, but not statistically significantly. The carrying of carpet rolls, according to the men's own opinions, became less loading on the lower and upper extremities. The men were also of the opinion that the work load was lower in fitting drain pipes, especially on the lower extremities and in the neck and shoulder region.

The conclusion was reached that work load can be decreased with well-planned equipment, but more attention should be given to personal work methods and habits.

References

Heeg, S, Biefang, S, Fliedner, T M: Arbeit und Gesundheit am Bau. Zusammenfassung einer Untersuchung zu Arbeitsbelastungen, berufstypischen Gesundheitsrisiken und Möglichkeiten der Prävention bei ausgewählten Bauberufen. Georg Thieme Verlag Stuttgart, New York 1989.

Holmström, E: Musculoskeletal disorders in construction workers related to physical, psychosocial and individual factors. Department of Physical Therapy, Lund University, Lund 1992.