Effect of a worksite wellness programme on the physical work capacity profile of workers in an electricity supply company

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Abstract

The aim of this study was to determine the effect of a worksite wellness programme on the physical work capacity profile of workers. Male workers who did not meet the minimum physical ability task requirement based on an assessment of ten essential physical abilities for their job were selected for this study. Twelve workers in the experimental group participated in a 24-month worksite wellness programme and 62 were in the control group. Pre- and post-tests determined if their physical work capacity profile met the minimum physical ability task requirements of their job. There was no practically significant (d = 0.8) difference between the two groups before the start of the programme after controlling for age, gender, motivation to change and initial physical work capacity profile differences. The results showed that workers whose physical work capacity profile did not meet the minimum physical ability task requirement of their job, were practically significantly (ω = 4.25) more likely to improve their physical work capacity profile through the 24-month worksite wellness programme to a level were they met the minimum physical ability task requirement of the job, than those receiving no intervention.

1. Introduction

Local and international organisations are suffering from economic strain due to the lack of sufficient physical work capacity of workers.[1-5] Research indicates that this results in the loss of billions of rands in workers' compensation claims, medical treatment and general production losses due to absenteeism, lost work time and poor quality of work.[6-8] O'Donnell and Shrey suggest that employers can no longer rely on government or outside third parties, like insurance carriers and claims management organisations to manage uncontrolled workers' compensation costs.[9,10] During the last decade these problems have led to an increase in companies offering worksite wellness programmes for high-risk employees declared unfit for duty, as a way to improve their physical work capacity and accelerate return to work.[9-13] These programmes focus on a total wellness approach in reducing risk of work-related injuries and improving productivity, and not merely directed to physical fitness *per se*.[9,14] Such an approach goes beyond disease management and includes optimal physical, spiritual and social well-being.[15]

Cox defines a worksite wellness programme as a comprehensive, multidisciplinary, and complex field that seeks to promote, improve, and optimize health, well-being, and performance of those associated with a place of employement.[14] These programmes provide the worksite professionals with an opportunity to support people's health and human needs in a more compassionate, effective way, instead of focusing on controlling isolated symptomatic illnesses or behaviours.[16] Programme participants then have the unique opportunity to heal their symptoms while also developing a deeper understanding of the underlying life struggles that these symptoms represent.[17] Worksite wellness programmes have been shown to expedite return to meaningful employment, minimize workdays lost, reduce premature retirement, and increase the productivity of injured workers.[9,11,14] Therefore, it seems that a worksite wellness programme could benefit the

physical work capacity profile of workers despite their inescapable illnesses, disabilities, and trauma.[18] No literature could, however, be found that indicated the impact of a worksite wellness programme on the physical work capacity profile of workers in physically demanding jobs based on the minimum physical ability task requirements of their job.

The management of an electricity supply company became aware of the increased injury and disability rate amongst workers in physically demanding jobs. Consequently, minimum physical ability task requirements were developed for all jobs with inherent physical task demands[3,19] as well as a worksite wellness programme for physically incapacitated employees in these jobs.[3] The question raised in this study was how a worksite wellness programme could influence the physical work capacity profile of workers in physically demanding jobs, based on the minimum physical ability task requirements of their job. Answers to this question could have given the company insight into the future management of physically incapacitated workers in these jobs and the use of a worksite wellness programme in this regard. The aim of this study, therefore, was to determine the effect of a worksite wellness programme on the physical work capacity profile of workers in the company based on the minimum physical ability task requirements of their job.

2. Method

2.1 Study design

A quasi-experimental design was used for this study as described by Goetzel and Ozminkowski, which consisted of a pre-test and post-test with comparison group design.[20] The experimental design determined the physical work capacity profile differences of the workers in these two groups over a 24-month period. Workers were assigned to the two groups on a non-random basis. Baseline differences among groups were controlled for through selection and statistical means. Factors controlled for include gender, age, motivation to change, and physical work capacity profile differences.

2.2 Study population

The research was conducted on workers in jobs for which minimum physical ability task requirements had been developed. Ethical clearance was obtained for the study from the North West University. All the workers in these jobs were subjected to a physical work capacity assessment, once they had given an informed consent to participate in the study. Workers that did not meet the minimum physical ability task

Table 1. Summary of apparatus and test protocol

Test	Apparatus	Protocol
Blood pressure	Sphygmomanometer and stethoscope	Systolic- and diastolic blood pressure is measured in the sitting position.
3 min. step-up	25 cm. High step bench; metronome; stethoscope	Step up and down a bench at a rate of 100 steps per min. A metronome gives the rate. Heart rate is taken after 3 min. for 15 sec. and multiplied by 4 for 1 min. heart rate.
Grip strength	Takai hand grip dynamometer	One maximal isometric contraction of the right- and left hand with the palms facing inwards.
Back muscle strength	Takai back/leg dynamometer; ergonomically developed platform to ensure correct execution	One maximal isometric contraction of the back muscles in a bent-over-straight-leg position with a harness fitted over the lower back and hooked to the dynamometer on a platform.
Leg muscle strength	Takai back/leg dynamometer; ergonomically developed platform to ensure correct execution	One maximal isometric contraction of the leg muscles in a squat position with a harness fitted over the upper back and hooked to the dynamometer on the platform.
Arm-/shoulder muscle strength	Takai back/leg dynamometer; ergonomically developed platform to ensure correct execution	One maximal isometric contraction of the arm/shoulder muscles in a pick-up-from-the-floor position with a handle bar fitted to the dynamometer on the platform, legs spread out backwards and the chest resting on a cushion.
Flexibility	Flexibility box	Push a marker (wooden block) horizontally as far as possible over a fixed ruler while sitting in a straight leg position.
1-min. Sit-up	Stop watch	Perform as many sit-ups as possible in 1 min. with the body in a sitting posture with the legs 90° bent.

" Worksite wellness programmes ... expedite return to meaningful employment, minimize workdays lost, reduce premature retirement, and increase the productivity of injured workers."

requirement for their job were selected for this study.

Seventy-five workers were identified that met the set criteria, of which one was a female worker. Gender bias was controlled for by focusing on the 74 male workers. In order to control for the effects of voluntary participation, workers were considered for the experimental group according to the capacity of the company biokineticists to handle them over the period of the research, and the willingness of management to release the selected workers, and not by the motivation of the identified workers to voluntarily participate. Prochaska et al. indicate that with voluntary participation individuals have, on their own accord, initiated the change process by indicating readiness.[22] This acknowledgement separates them from other individuals who have not yet decided that they wish to change and could provide biased results when comparing an experimental group with a control group.[22] As noted, the experimental group size was limited for two reasons. There were cost implications for the company because the workers would not be able to perform their work and the biokineticists had to commit to providing the programme for the 24 month period, in addition to handling their usual workload. Therefore, permission was only given for a small number of workers to participate in the programme.

Twelve workers were finally incorporated into the experimental group and the remaining 62 made up the control group.

2.3 Apparatus and test protocol

The apparatus and test protocol used to measure the physical work capacity profile of the workers followed the procedure outlined by Lubbe[3] (see Table 1 and Figure 1). The results of the physical work capacity assessment for each participant were analysed by the company biokineticists according to the testing procedure that determined the physical work capacity profile for each participant. (A Biokineticist is a specialised exercise therapist that functions in professional alliance to health

Figure 1. Measuring physical work capacity

and medicine, and is recognised by and registered with the Health Professions Council of South Africa.)[21]

2.4 Testing procedure

All workers in the experimental and the control groups completed a pre-test and a post-test after 24 months. Each worker was tested and classified as meeting or not meeting the physical work capacity profile.

2.5 Intervention procedure for experimental group

The experimental group was subjected to a worksite wellness programme coordinated by the biokineticists in four different wellness centres of the company across the country. In the worksite wellness programme, participants followed exercise programmes to improve their physical work capacity profile and also received preventive lifestyle and work safety training to empower them to live a healthy lifestyle and productive working career with self-responsibility, balance, and personal development in all areas of their well-being. A specialised multidisciplinary team consisting of biokineticists, employee assistance practitioners, occupational health practitioners, and human resources practitioners attended to each participant. The multidisciplinary team regularly followed up on the participants over the 24-month period to determine their progress, to make programme adjustments and continue with lifestyle, and work productivity enhancement training. This was done to assist the participants to acquire a "Meet" physical work capacity profile and sustain it over the 24-month period. Table 2 shows the progress strategy followed in the worksite wellness programme over the 24 months, based on the physical work capacity profile improvements of the workers.

Table 2. Worksite wellness programme progress strategy

Intensity phase	Frequency of visits to the Wellness centre	Duration
Intensive	Daily	2 weeks
Periodic	Monthly	6 months
Maintenance	Six monthly	2 years

With this strategy, the workers followed a three phase programme, starting with the Intensive phase followed by the Periodic and Maintenance phases. For each of these phases the participants followed a set frequency of full day visits to the Wellness centre for the given period as indicated in Table 2. In the Intensive phase of the programme they were at the centre full time for the two weeks. During this time they had three group exercise sessions daily, and in between these sessions they received individual counselling, regular progress assessments and attended personal development workshops. In the Periodic and Maintenance phases, the participants visited the centre for two days where they continued with the activities indicated in the previous phase. They also received home programmes prescribed by each health and wellness professional. Progress was monitored through an

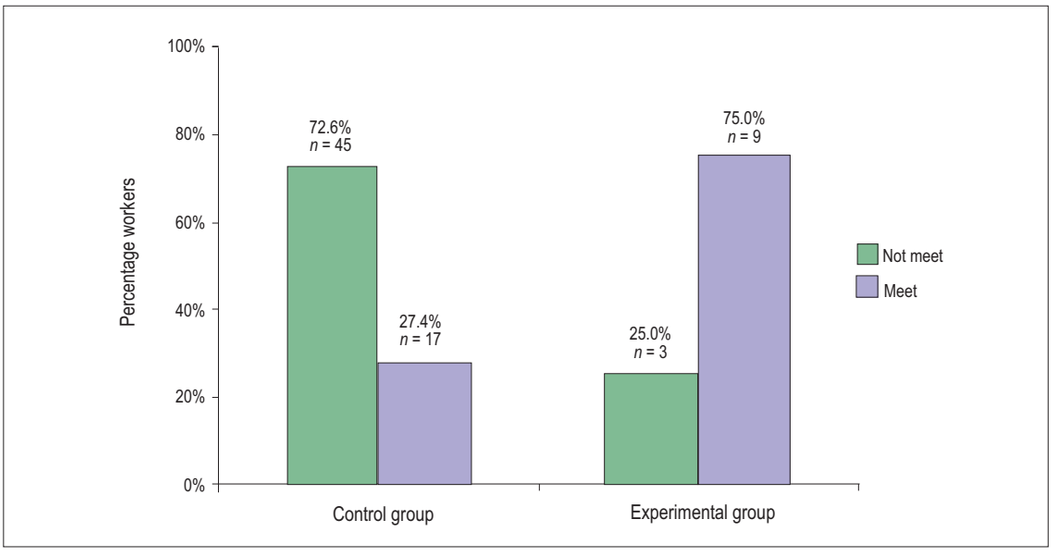

Figure 2. The percentage of workers in the experimental and control group that had a "Not meet" or "Meet" physical work capacity profile after the 24-month worksite wellness programme

" ... they had ... group exercise sessions daily, and ... received individual counselling, regular progress assessments and attended personal development workshops."

activity diary and supported by supervisor and relevant multi-disciplinary team members. After each phase, the participants were retested, and if their physical work capacity improved sufficiently according to the professional opinion of the biokineticist, they moved over to the new Intensity phase. It was intended that participants who did not improve during the programme would be subjected to a multi-disciplinary team decision on whether to continue with the programme or propose an alternative intervention not part of this study. All participants in the experimental group, however, completed the 24-months intervention period.

3. Results

Statistical analyses were performed using the STATISTICA software package.[23] As this study used a selected population, statistical significance calculations, for instance the Chi-squared tests, generally used for random groups, were not relevent.[24,25] Practical significance tests as described by Steyn, that are applied to determine the effect size of the difference between populations, were therefore used.[26] Cohen indicates that practical significance implies a large enough difference to have an effect in practice.[25]

Ageing has been identified as a factor that could affect the internal validity of the results when comparing two groups.[9,27] Therefore, to determine if age could have any effect on the results, the effect size of the age difference between the two groups was determined. There was no practically significant difference in the mean ages of the workers in the control and experimental group (48.9 and 46.4 years respectively).[26]

The post-test results indicated that 72.6% of the workers in the control group still had a "Not meet" physical work capacity profile after the 24-month period, whereas only 25% of the workers in the experimental group that followed the worksite wellness programme had a "Not meet" physical work capacity profile (see Figure 2). The percentage of workers in the experimental and control group who had a physical work capacity profile of "Meet" and "Not meet" after the 24-month intervention period, was compared with two-way frequency tables. The odds ratio statistic as described by Steyn[24] was used as an effect size measure for the two-way frequency tables to determine the odds ratio that a worker in the experimental group was more likely to have a "Meet" physical work capacity profile than a worker in the control group. The odds for the workers to receive a "Meet" physical work capacity profile after the 24-month intervention period were 0.38 for the control group and 3.0 for the experimental group, yielding an odds ratio of 7.94 for the two groups. The result of ω=4.25 was considered as practically significant, since it indicated that the difference in the proportion of workers with a "Meet" physical work capacity profile between the two groups had a large effect.[26]

4. Discussion

None of the participants met the minimum physical ability task requirements of their job at the pre-testing. However, after the 24-month worksite wellness programme, 75.0% of the experimental group had a "Meet" physical work capacity profile compared with only 27.4% of the control group after the same period (see Figure 2). The odds ratio statistic indicated that it was approximately eight times more likely for a worker in the experimental group to receive a "Meet" physical work capacity profile after the 24-months, than for a worker in the control group. Ageing was not found to have had a practically significant effect on the comparative results between the two groups.

The worksite wellness programme, therefore, had a practically significant positive effect on the physical work capacity profile of the workers in the experimental group, compared to those in the control group. No studies on the effect of a worksite wellness programme on the physical work capacity profile of workers, based on the minimum physical ability task requirements of their job were located. However, the results of this study support earlier findings indicating that physical exercise and health promotion have a positive influence on the physical health status of workers.[11,13,27,28] Grace, using a similar study design and work environment, reported positive changes in some physical ability parameters inherently required of the workers participating in a six-month physical wellness programme.[13] Several studies on worksite wellness programmes have been shown to expedite return to meaningful employment, minimise workdays lost, reduce premature retirement, and increase the productivity of injured workers. For example, O'Donnell and Cox report that worksite wellness programmes have been shown to expedite return to meaningful employment and increased productivity of injured workers.[9,14] However, similar research in physically demanding jobs is limited.[11-14,27] Proper et al. emphasize that scientific evidence in this regard is scarce.[5]

5. Conclusion and recommendations

The worksite wellness programme outlined in this study assisted workers whose physical work capacity profile did not meet the minimum physical ability task requirements of their job to regain the required physical work capacity. These results could further assist organizations to provide an alternative option to managing the physical work capacity of their workers, other than ill-health retirement, retrenchments or prolonged sick-leave. The small experimental group in this study is a limitation and similar but larger studies in other industries are required. Research on the financial advantage of a worksite wellness programme directed to the physical work capacity of workers based on the minimum physical ability task requirements of their job could also be useful.

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" The worksite wellness programme ... had a practically significant positive effect on the physical work capacity profile of the workers ..."

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