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Work ability program produces short-term productivity improvements

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Abstract

The aim of this work was to study the development of sick leaves and presenteeism during a work ability program that has earlier proved to produce improvements in workers' perceived ability to work. Productivity losses were determined for 70 employees from four organizations and for 42 controls. Numbers of sick leave days (SLD) were collected from employers' records for three months before the program started and each subsequent three months for one year after the initiation. Presenteeism was determined for four weeks before and after one year of the program implementation. In the first three months of implementation SLD reduced among project members by 55% and increased by 27% among controls ($p<0.001$). However, during the last two measurement periods, the project subjects had more SLD than they had before the program started ($p<0.001$), and also more than the controls ($p<0.001$). Overall, during the one year implementation the program subjects had on average 23% increase in SLD, whereas the controls had 35% decrease in their SLD ($p<0.001$). Program participants experienced per month 3.6 hours more presenteeism after the one-year implementation and among the controls presenteeism increased by 2.5 hours. Work ability program produced short-term productivity benefits, but with longer program duration the benefits disappeared.

Keywords: work ability, absenteeism, presenteeism, productivity, sick leave

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1 INTRODUCTION

Work ability programs are widely used to answer the challenges related to changing business environment and demands for improved productivity. Work ability is perceived as a rather complex concept (Machioca et. al. 2012), and same program may produce varying outcomes depending on the environment it is implemented. Thus, the observed program's benefits should not be directly generalized to any other work environment, but the expected benefits should be carefully studied in each context the program is implemented. When a program proves to be effective, employees benefit by improved work ability, and health. Employers benefit from healthier employees, reduced sick leave and higher productivity (Van Holland et. al. 2012). In a German health insurance firm AOK, introduction of modern health management system was followed by 6.7% reduction in absenteeism (days off work due to sickness) and 7.6% reduction in sick pays (Elsler et. al. 2010).

From employers' point of view, one of the important work ability program's benefits is improvement in overall productivity. Previous studies have shown that poor poor work ability has been highly predictive for increased sick leave days and receiving a disability pension (Alavinia et. al. 2009, McConagle et. al. 2014). However, in many workplaces productivity as such is difficult to determine, and measures of sick leave days and presenteeism (feeling sick while at work) have been used as indicators of changes in productivity (Prasad et. al. 2004, Zahng et. al. 2011). Stronger work engagement has been shown to be significantly associated with better work ability (Airila et. al. 2011). Poor work ability has strongly predicted prolonged sick leaves [Bethge et. al. 2012]. However, some studies have shown that work ability programs may not always produce reductions in sick leaves (Bonde et. al. 2005, Drews et. al. 2007).

High levels of agreement have been found between self-reported and employer administrative sickness and absenteeism data (Rees et. al. 1993, Revicki et. al. 1994), but self-reported absenteeism has also been shown to underestimate the hours and days missed and overestimate the number of hours worked compared with employer payroll records (Kessler et. al. 2003). Older age of employers, lower level of education and particularly longer recall time have been suggested to reduce the accuracy of self-reported data (Short et. al. 2009). Presenteeism estimates are probably even more susceptible for recall bias and shorter recall periods for these measures has been recommended (Prasad et. al. 2004, Sanderson et. al. 2007, Beaton et. al. 2010).

The aim of this work was to study the development of sick leaves and presenteeism during a work ability program that has earlier proved to produce improvements in workers' perceived ability to work.

2 MATERIAL AND METHODS

Altogether 70 white collar office employees from four organizations were enrolled to work ability program in 2012-2013 utilizing the tested concept of Metal Age method (Machioca et. al. 2012). From two of the organizations another 42 employees who were working in other cities were enrolled as controls. It was the task of company representatives to recruit participants for this study without any selection based on e.g. previous sickness absence records. These representatives did not, however, make any

notes on refusals. Three subjects were considered to have a lot of missing data and they were not included in the final analyses.

The Metal Age method is considered simple and fast to apply. In the method employer's and employees' representatives determine together the issues that are currently on the table in the respective working place. An integral part of the method is prioritization of the development areas that have been recognized. Not all important issues can be handled at the same time. The most important and/or up to date issue will be tackled first. After the issue at hand has been satisfactorily solved, the representatives determine the issues that are on the table at that moment and again the most important and/or up to date will be tackled, etc. This takes place usually at around three months after the program implementation has started. The aim of the method is to alleviate the work-related stress and to improve communication skills, not forgetting the company's productivity and profitability. Participants (employees) underwent a two-day intervention course in Metal Age method, where they agreed about the solutions needed for enhanced well-being at work at their unit. In every organization there were three facilitators. Facilitators were included in these two-day interventions, and moreover facilitators had a one-day in-depth education in Metal Age method. Facilitators' task was to maintain and remind participants about the solutions and proposals employees had agreed of during their Metal Age courses. Facilitators consisted employees, who were especially engaged in organization's personal matters.

Among other things the subjects estimated the numbers of sick leave days during the preceding year. However, this information was not used in calculation of actual productivity losses. It was used to estimate how well self-reported sick leave days correlate with those found in employer record, which are the basis for estimating employees' salaries and sick leave compensations.

From the employers' records we collected the numbers of sick leave days for three months period before the program started in early 2012 and each subsequent three months period for one year after the initiation of the program. For each three months period the number of sick leave days/person/month (SLD) were computed. Also the overall number of sick leave days during the one-year period of program implementation was computed. Presenteeism was determined using two tested and widely used questions (Alavinia et. al. 2009, McConagle et. al. 2014 Sanderson et. al. 2007, Beaton et. al. 2010). First the subjects were asked: How many hours during the preceding 4 weeks have you been at work, although you have thought that because of sickness or health related reasons you should have stayed at home, i.e. you have been sick at work?

After this the subjects were asked to mark on the given 10 cm long Visual Analog Scale (VAS) the point which best described the magnitude of reduced productivity during the hours of perceived presenteeism. The left side end point was marked 0 and labeled 'not at all', and the right side end point 100 with label 'Extremely'. Overall effect of presenteeism on productivity was determined by multiplying the numbers of presenteeism hours with the reduction percentage obtained from the VAS scale. Gross monthly income level of each subject was obtained from the employers and the productivity loss estimates were based on Human Capital Approach (HCA), where the cost of an hour is the monthly gross income divided by the average number of monthly working hours.

Statistical evaluation of the proportions was based on chi-square test and mean values on Student's t-test.

Qualitative research consisted of 8 face-to-face interviews at two of the participating organizations. Interviews were audio-recorded and transcribed and analyzed by applying principles of Grounded Theory method (Glaser et. al. 1967, Strauss et. al. 1987). Atlas.ti 6.2 program was used during process of analyzing. The main principles of Grounded Theory are open coding, axial coding, selective coding and continuous comparison between codes, memos and categories. The main themes at the interviews were; how the participants have experienced Metal Age process and how the process has influenced their working conditions and/or atmosphere.

3 RESULTS

The average age of the program group was 44 years and of the controls 47 years (NS). Average salary levels were also close, among the program group 3155 € per month and the controls 3066 € per month (NS). However, the variation in the salaries in both groups was considerable. Thus, the numbers of sick leave days do not necessarily produce corresponding sick leave costs. Average WAI scores showed improvement among the program group from 41.3 to 41.9, but reduction from 42.4 to 39.3 among the controls. The difference in change scores was statistically significant ($p<0.001$). Self-reported estimate of sick leave days during the one-year of project implementation was well in line with the records of the employers. Eleven program participants reported 1-9 sick leave days, although in employers' records they had none. One control group member also reported belonging to a 1-9 sick leave days group, although no sick leave days were found in the employer's records. Otherwise the match was perfect.

Before the initiation of the program the program subjects had slightly (NS) more often (43.8%) and more sick leave days (SLD=0.414) than the controls (42.9% and SLD=0.325). After the first three months of the project implementation the SLD had reduced by 55% to 0.186 among the program subjects and increased by 27% to 0.413 among the controls ($p<0.001$). Over the next three months the SLD declined further to 0.148 among the program subjects, but even more to 0.016 among the controls ($p<0.001$). However, during the next two measurement periods, 7-9 and 10-12 months after the initiation of the project, the project subjects had significantly ($p<0.001$) more SLD (0.803 and 0.884) than they had before the program started, and also significantly ($p<0.001$) more than the controls, 0.143 and 0.286 respectively. Also the proportion of subjects with sick leave during the last three months was slightly (NS) higher among program subjects (51.5%) than among controls (37.4%). Increase in sick leave days in the pogram group was not due to any individuals having particularly long sick leaves, neither was it concentrated on few subjects with frequent sick leave periods. Overall, during the one year implementation of the program the program subjects had on average 23% increase in SLD, whereas the controls had on average 35% decrease in their SLD ($p<0.001$). (Figure 1)

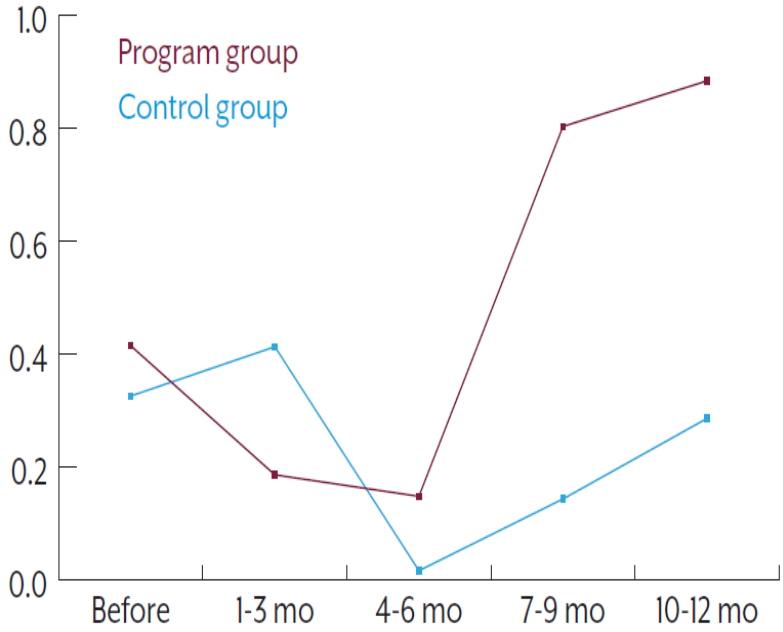

Figure 1. Average monthly sick leave days in three months periods for three months before implementation of Metal Age program and each three months period during the implementation among Metal Age program participants and controls.

The qualitative research shows that at the start of the process personnel were eager to work with issues identified and worked actively together. However, after doing that for a longer period personnel began to experience the program as burden since they felt that it took too much time from their usual work. Informants told also that all issues they were working with were very concrete.

Presenteeism was slightly, but non-significantly more common among program participants than controls in the beginning of the program (39.4% vs. 31.6%), but the opposite was observed in the end of it (38.6% vs 47.1%). During the one month period before the program implementation Metal Age program participants experienced on average 7.1 hours of presenteeism with 16.3% reduction of productivity during those hours. After the one-year of program implementation these program participants experienced on average 10.7 hours of presenteeism with 15.4% productivity reduction. Among the controls the average monthly hours of presenteeism was in the first measurement 5.1 and reduced productivity 15.8%, and the corresponding measures at the second measurement 7.6 and 22.9%. The loss of productivity during presenteeism hours was significantly ($p<0.05$) higher among the controls than program participants. Monthly productivity costs of sick leave days before the program implementation were higher (NS) among the program group than among the controls. After the program had been implemented for a year, the average monthly sick leave costs for the last three month period were highly significantly ($p<0.001$) higher for the program group than for the controls. Among both the program and the control groups the sick leave costs fluctuated significantly during the observation periods. (Table 1)

Table 1. Average monthly cost (€) of sick leaves using Human Capital Approach before the program implementation and for each three months period during the program implementation among Metal Age program participants and controls.

	Before	1-3 months	4-6 months	7-9 months	10-12 months
Metal Age	60.31	23.90	31.14	144.44	61.31
Controls	25.58	72.00	2.48	28.04	4.96

Presenteeism cost estimates were available only for the one month periods before the implementation of the program and after the first year of its implementation. Before the program implementation the presenteeism costs were slightly (NS) higher for the program group (39.78 €) than for the controls (25.77 €). After the program implementation the average presenteeism costs for the program group (82.24 €) remained higher (NS) than for the controls (63.48 €). Overall productivity costs, measured as average monthly sick leave and presenteeism costs together for three month periods before program implementation and after one year, were slightly but non-significantly higher for the program group than for the controls. One third of all employees did not have any productivity costs due to sick leaves or presenteeism. Among both groups the overall productivity costs increased, but more among the program groups.

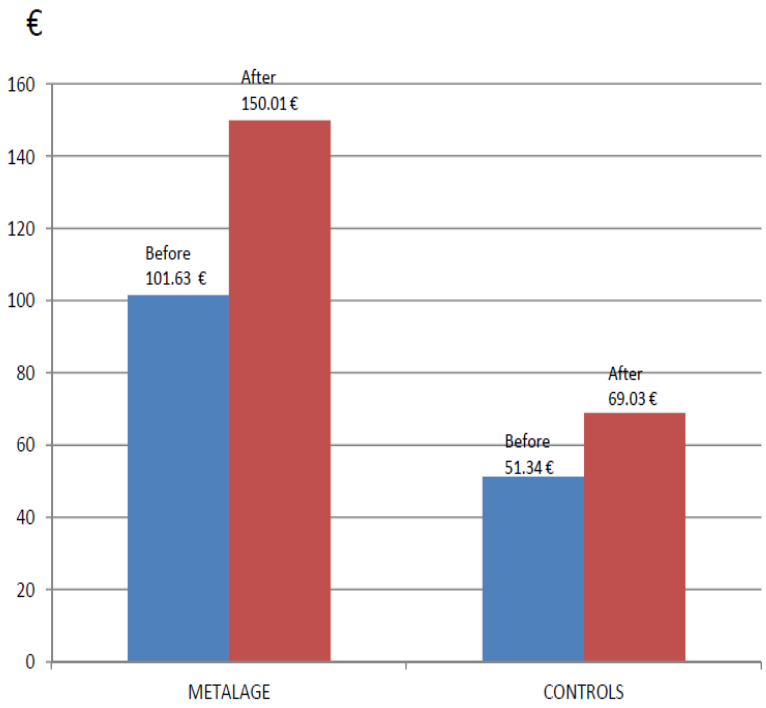

Figure 2. Average monthly costs of sick leave days and presenteeism for three month periods before the program implementation and after a year mong MA program participants and controls.

4 DISCUSSION

Previous implementation of the Metal Age program (Bergström 2005, Rissa 2007) has suggested that significant economic savings could be obtained with it. However, the study setting in that previous implementation did not include proper comparison group and its findings should be considered with caution and as a pilot study. Although the program and comparison group subjects had same employers, they were located in different cities and had very limited opportunities to communicate with each other's. Thus, any probability of flow-over effect was seen minor. Our study did not corroborate the positive results of the earlier works. On the contrary the numbers of sick leave days and their costs did not develop to the anticipated direction. The Metal Age program participants' higher numbers of sick leave days and consequent productivity losses to employers were more likely to be considered as discouraging. These findings corroborate those of Bonde et. al. (2005) and Drews et. al. (2007) earlier, supporting the idea that a work ability program which has been successfully implemented in one setting may not produce similar effects when applied to another settings. According to persons interviewed, many times several issues to improve were identified, not only one. Also the fact that out-side facilitator was not used after the start of the process can have influenced the process negatively.

During the first months of the program implementation, positive signals were obtained. In the Metal Age program the employees' and employer's representatives plan how to prioritize the development areas they have recognized, and the topic with highest priority is tackled first (Maciocha et. al. 2012). It may well be, that working on the issue with the highest priority motivates the employees and this can be seen in the proportion of sick leave days in the beginning of the follow up. When issues of less perceived

importance are worked on, employees' interest and motivation level may decline. Qualitative research findings may indicate that working with concrete issues seems to have an ambivalent effect. On one hand, working with concrete issues can hide more significant issues under surface but on the other hand it can also bring significant, more abstract issues, such as sub-group phenomenon, up to surface. In this way the program can actually prevent positive development of social inclusion at working places.

Subjects who know that they belong to certain test-group can be expected to behave differently, because they know that their actions are under surveillance (Roethlisberger and Dickson 1939). This may also have an effect on the Metal Age group members' willingness to be on sick leave, particularly in the beginning of the program implementation when issues with the highest priority are worked on. However, the project participants and controls were not told that the numbers of sick leave days were to be collected from the employers' records. Physical job demands have earlier been shown to be associated with higher number of sick leave days (Johannson et. al. 1995, Brulin et. al. 1998, Hoogendoorn et. al. 2002). However, in the present study the recruited workers both in the program and control groups had practically only office duties, and physical job demands cannot explain the observed findings.

Both the program participants and the controls showed least sick leave days during the period of 4-6 months of project implementation. The program did not start at the beginning of the calendar year and this three months period was mainly during the prime holiday season in Finland. At the time of the program implementation, short sickness periods, less than a week, during the annual holidays were not covered by the employer. Thus, short sickness periods were not counted by those on annual leave, which is the more acceptable explanation for the reduction of sick leave days in both groups at this time of the observation period than any program activity. Particularly after the main holiday season the development of sick leave days among the program participants was surprisingly negative.

The cost consequences of the sick leaves did not exactly follow the fluctuation of the days absent from work. This finding owes to the fact that the numbers of sick leave days were relatively small for each three months period, and the salary level of those with sickness absence in each measurement period varied considerably. However, the trend in costs and differences between the two groups were similar in sick leave days and in consequent productivity costs.

It is not clear why both among the program participants and the controls also presenteeism hours were higher at the second measurement point than a year before. One reason may be that in the follow-up the subjects were aware that questions dealing with presenteeism were asked, and they were better able to recall them. Four weeks is relatively long period when it comes to remember units like hours of presenteeism, which may have had an influence. Economic recession has been prevalent throughout Europe also during the study period and Finland has not been in any different situation from other European countries. When economic situation is unfavorable and there is rather shortage than surplus of job openings, employees are probably not that willing to change work places than when demand for work force is higher. Also in poor economic situation employees may feel their position at work more threaten, and they do not necessarily want to show many days of absence, if it is somehow in their control to stay at work. In such situations, when health status worsens slightly, the employees may decide to come to work, although during better economic times they might have decided

to stay at home and take a day off. However, the development of sick leave days, particularly among the program subjects, does not support the idea of trade-off between less sick leave days and more presenteeism hours.

In this study qualitative data was used as an attempt to get substance and deeper understanding to the quantitative data, how personnel at the organizations experienced the Metal Age process. According to the qualitative research, Metal Age process had no effect on commitment to work among employees even if there was some positive development concerning mutual understanding and trust between leaders and employees.

One major aim of the Metal Age program was to increase the overall productivity of work places. The observed 50% average increase in productivity losses among program participants, compared to 25% increase among controls, does not encourage direct implementation of the method to other work places. The method has shown positive effects in one municipality earlier, although the study setting did not include any control group (Bergström 2005, Rissa 2007). It may be that the method is applicable and economically beneficial to certain work places, whereas some other settings do not obtain equally good results. In our study, the numbers of employees and controls in each work place were too small to make reliable comparisons within work places. However, the program had also qualitatively positive effects such as co-operation among personnel, co-operation between superior and personnel and experience of community among personnel. Besides that it seems quite obvious that Metal Age was experienced differently among employees and employers. Employers experienced it as start-kick to change things and employees experienced the process as not very effective. Though, it is difficult to conclude whether ineffectiveness depends on the model or how the process was realized. Before recommending use of Metal Age method in larger variety of work places, more studies with higher number of participating employees and controls are required.

5 CONCLUSION

Short term effects of the implemented work ability program on sick leave days seemed beneficial. However, with longer program duration the benefits disappeared. Based on our experience, we would recommend long enough follow-ups to study whether possible short-term benefits remain when the programs are run longer. The program shows more ambivalent aspects than positive aspects at qualitative research and therefore it is uncertain if the model has effects to social-inclusion and well-being at work.All data collection, storage and handling have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. The ethical committee of Helsinki and Uusimaa Hospital District approved this study, decision number 37/13/03/00/12, dated 30.05.2014**.** All persons gave their informed written consent prior to their inclusion in the study. The authors declare that they have no conflict of interest. All three authors have given their approval for submitting the final draft of the manuscript.

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