

**Many office workers are tired in the end of a normal workday!**  
**Effects of exercise/movements**

## **1 How do we know that many office workers are tired in the end of a normal workday?**

Backapp AS has done a research project supported by the Norwegian Research Council (Skattefunn project). One of the targets was to document the extent of tiredness or discomfort experienced by office workers in the end of a normal workday and the effects of exercise/movements by using the Backapp Smart (chair) and Backapp 360 balance board.

354 office workers from Norway (KGH Custom Service) from Sweden (Kongsberg Maritime, Ving Thomas Cook Northern Europe Division, Tretton 37) and from Denmark (Kamstrup, Siemens Gamesa, Toyota and OK oil) participated in the study.

The 354 participants were 209 women and 145 men. The average age was 42 years. Height and weight were normal.

Before the study started, the participants were sitting on normal office chairs with back support, both with and without armrests. All participants had an electric sit/stand height adjustable desk. They used the Backapp Smart chair and the Backapp 360 balance board for 6 weeks. They stopped using the normal office chair the day the study started and used only Backapp Smart and Backapp 360 for 6 weeks until the study was completed.

The participants completed a questionnaire created by Force Technology in Denmark, and third independent party. Force Technology also collected the data, developed the statistics and reported the results.

## **2 What did we find?**

The office workers were working in the seated position in front of the screen an average 5.4 hours per day. They were working in the standing position an average 1.2 hours per day.

The office workers were asked “how often are you tired in the end of a normal working day?” The answers were submitted anonymously. Results are in Table 1. Before the study, 101 (28,5%) answered that they were tired at the end of a normal working day every day or quite often. After 6 weeks using Backapp Smart and Backapp 360 the number had decreased to 61 (17,2%), so the effect was significant (Table 1).

Table 1 shows that the 18 participants who were tired every day were reduced to 10. The 83 being tired quite often were reduced to 51. The number of participants being tired «now and then» increased to 163. The participants being tired infrequently increased from 98 to 109.

Table 1. How often do you feel tired at the end of a normal workday?

	Before the study started		After 6 weeks with Backapp		After 6 weeks – Before the study
	Number	Percent	Number	Percent	Number
Never	21	5,9	21	5,9	0
Infrequently	98	27,7	109	30,8	11
Every now and then	134	37,9	163	46	29
Quite often	83	23,4	51	14,4	-32
Frequently/every day	18	5,1	10	2,8	-8
Total	354	100	354	100	

p=0,014(significant)

## **Many office workers are tired in the end of a normal workday!** **Effects of exercise/movements**

### **3 What did we learn from the results?**

Being tired in the end of a normal working day is a problem for office workers. When you are tired your working capacity decreases, and the number of mistakes increase. 28,5% of the office workers stated that they were tired every day or quite often. You come home tired, and it is tempting to just sit down and relax on the sofa. The rest of the day is often passive.

Movements in the workplace is important to prevent tiredness during the end of the workday. Passive sitting during the workday is the norm for most office workers. Only the head and arms are engaged during office work. The rest of the body is “not required”. We can turn it the other way around and say that the body is important to provide energy to the head. A slow body having pains reduces the ability maintain focus and reduces brain capacity.

When using Backapp Smart and Backapp 360 you exercise the body whether you sit or stand. You unconsciously maintain your balance when you stand on the Backapp 360 and when you sit on Backapp Smart. Scientific studies show that the energy consumption increased by 19% sitting on Backapp Smart compared to sitting on a normal office chair watching a video (Synnott et al. 2017). The muscles work to keep the balance which keeps you more awake.

If 28,5% of the office workers are tired at the end of a normal working day, what is the price paid? If we look at a company of 354 office workers having an average salary plus costs of 825 000 NOK pay 83,325 million of NOK per year to the 101 who are tired in the end of a normal working day. Is it possible to increase the working capacity for the 101 by 10%? This means a saving of 8,333 million NOK per year minus the costs to purchase Backapp the Backapp products which is 3,2 million NOK or 0,64 million NOK using a 5 year of depreciation.

### **4 Literature**

Ergonomics (volume 60, Issue 10) Pages 1384-1392

"The effect of a dynamic chair on seated energy expenditure." Aoife Synnott, Wim Dankaerts, Jan Seghers, Helen Purtill & Kieran O'Sullivan 2017