



Original Article

The effects of a two-minute original exercise program supported by the workplace unit on the workers' work engagement: the "Bipoji" exercise

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Abstract. [Purpose] This study examined whether workplace support of an exercise program would increase the workers' engagement. [Participants and Methods] Employees at two facilities of the Kyoto Industrial Health Association (the Uji branch and the headquarters) were recruited. A survey of 238 employees was conducted. A seminar was held, at the facilities, about the "Bipoji" exercise program and afterward the participants underwent different procedures. The Uji branch (the support group) supported the continuation of the program for two months. At the headquarters (the control group), the individual decided whether to continue the program. Data were collected at the time of the seminar (the baseline) and two months later. A questionnaire measured work engagement using the Utrecht Work Engagement Scale. [Results] At the follow-up, data were collected from 65 people (60.2%) from the support group and 97 people (74.6%) from the control group. The average change in the Utrecht Work Engagement Scale scores was 1.7 and -1.2, for the support group and the control group, respectively. When adjusted for background factors, the change was 1.6 and -1.2, for the support group and the control group, respectively. This indicates a significant increase in work engagement for the support group. [Conclusion] These results suggest that a workplace exercise program can improve work engagement.

Key words: Occupational health, Work engagement, Exercise (promotion) at workplace

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INTRODUCTION

Currently, as the working population is decreasing, companies and society are required to utilize a diverse labor force and improve the quality of their work. Not only from the viewpoint of mental health, but also from the viewpoint of health management, the creation of a workplace that has high productivity and that safeguards the mental and physical well-being of employees is required. Burnout is a common mental health problem in the working population that affects the well-being and productivity of workers¹⁾. However, work engagement is the opposite of burnout; it is a persistent and pervasive affective-motivational state of work-related well-being that is not focused on any particular object, event, individual, or behavior²⁾. Furthermore, in several studies it is reported to be associated with high life satisfaction, job performance, a better health condition, and lower depression and anxiety³⁻⁵⁾.

Recent research also suggests that posture is related to productivity not only in terms of the physical aspect but also in terms of mental health. Regarding the physical aspect, when the body's alignment is adequate, the balance of the muscu-

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loskeletal structure improves and work efficiency increases, and it is less susceptible to injury or deformation⁶). Regarding mental health, appropriate body alignment (an upright posture) helps to maintain self-esteem, reduce negative mood, and increase positive mood⁷). These positive emotions can affect the productivity of the working population. Thus, appropriate posture affects performance directly and indirectly via increased work engagement.

Yet, although there is evidence that exercise is beneficial for the working population it is difficult to promote if the content is complex and time-consuming. As such, we developed a simple exercise program for optimal posture that can be completed in a short time (about 2 min). By acquiring the optimal posture, we expected that the mental and physical well-being of employees and their work engagement would increase. Therefore, in this study, we examined the relationship between work engagement and the continuation of our exercise program.

PARTICIPANTS AND METHODS

In October 2015, all of the employees at two facilities of the Kyoto Industrial Health Association (Uji branch: $n=200$; headquarters: $n=150$) were recruited via an invitation letter from the authors. The survey was conducted in November 2015. During the survey period, the occupational health staff distributed an informed consent form to each employee. All employees were assured that their participation was voluntary. The Ethics Committee of the Kyoto Industrial Health Association approved the study protocol and informed consent procedure (approval number: 2005002). In total, 238 employees participated in this study.

We held a seminar about the “Bipoji” (Beautiful Body Balance-Position) exercise program (explained below) at the two facilities. After the seminar, the two facilities conducted different procedures. In the Uji branch, a promotion committee was elected for the purpose of establishing the exercise program. They supported the continuation of the Bipoji exercise program (the support group). In the support group, the Bipoji exercise program was conducted for a fixed time (2 min) on each working day for 2 months. In the headquarters, it was left to the individual to decide whether or not to continue the Bipoji exercise program (the control group). For both groups, data were collected at the time of the seminar (baseline) and 2 months later.

The Bipoji exercise program involved stretching the following joints and body parts in an upright posture: (1) elbow/fingers, (2) shoulder and cervical spine (retraction), (3) lower leg/ankle joint, (4) hamstring and shoulder girdle, (5) lumbar spine (lower lumbar extension: modified as one stretch), (6) thoracic spine (trunk rotation), and (7) trunk and upper arm. This exercise program was developed by musculoskeletal specialists taking into account the elements of classical ballet and a relaxation method, and it was accompanied by an original song in Bossa Nova style. It took about 2 min. The underlying concept of the exercise program was to prevent musculoskeletal pain, develop an adequate posture, and provide physical and mental relaxation.

The questionnaire included questions regarding gender, age, body mass index (BMI), and smoking status, and the Japanese version of the Utrecht Work Engagement Scale (UWES) was employed to measure work engagement^{1, 8}). The UWES consists of nine items with a seven-point Likert scale ranging from 0 (never) to 6 (always). These items are divided into three subscales: (1) vigor, which is characterized by high levels of energy and persistence during work even though difficulties are present; (2) dedication, which is characterized by significant involvement in the work (i.e., pride, enthusiasm, and a sense of challenge from activities); and (3) absorption, which is characterized by full concentration on the job. The range of each score of three subscales is 0–18 points. The total score is computed by summing the score of each subscale, (0–54 point). A higher UWES score represents a higher level of work engagement.

The demographic and clinical characteristics were compared using the Student’s *t*-test for the continuous variables and the χ^2 test for the categorical variables. The least square means analysis (using the PROC GLM procedure in SAS) was employed to assess the change in the UWES scores (0 to 2 months) between the groups. The least square means were adjusted for age, gender, BMI, smoking status, and the baseline UWES scores. All statistical tests were two-tailed. The level of statistical significance was set at $p<0.05$. The statistical analyses were conducted using SAS 9.4 (SAS Institute Inc., Cary, NC, USA).

RESULTS

A total of 238 participants were included in the analyses. Table 1 presents the demographic characteristics at the baseline. There was a significant difference in gender, but there were no significant differences in age, BMI, smoking habit, or the UWES score between the groups.

At the follow-up after 2 months, data were collected from 65 people (60.2%) in the support group and 97 people (74.6%) in the control group. The background (gender, age, UEWS score, total) of the support group and the control group showed a statistically similar tendency except for the dropout cases. The average of the change in the UWES scores: vigor, dedication, absorption, total was 0.4 and -0.7 , 0.5 and -0.2 , 0.8 and -0.4 , 1.7 and -1.2 for the support and control group, respectively. The least square means adjusted for the background factors were shown in Table 2. There was a significant increase for the support group’s work engagement in vigor, absorption, total, but not in dedication.

Table 1. Baseline characteristics of the participants of the study

	Support group	Control group	p-value
	n=130	n=108	
Age (yrs), mean \pm SD	39.1 \pm 10.6	40.5 \pm 10.3	0.3
Male, n (%)	36 (27.9)	45 (41.3)	0.03
BMI (kg/cm ²), mean \pm SD	20.8 \pm 2.9	21.4 \pm 2.9	0.15
Smoking, n (%)	17 (13.1)	14 (13.3)	0.95
UWES-total, mean \pm SD	26.3 \pm 8.1	25.3 \pm 9.6	0.37
UEWS-vigor, mean \pm SD	8.3 \pm 3.1	8.0 \pm 3.5	0.32
UEWS-dedication, mean \pm SD	9.8 \pm 2.9	9.4 \pm 3.2	0.34
UEWS-absorption, mean \pm SD	8.2 \pm 2.4	8.0 \pm 3.6	0.60

SD: standard deviation; BMI: body mass index; UWES: the Japanese version of the Utrecht Work Engagement Scale.

Table 2. Adjusted mean UWES score changes (vigor, dedication, absorption, total)

	Support group	Control group	p-value
	n=97	n=65	
UEWS-vigor, mean (95%CI)	0.4 (-0.2 to 1.1)	-0.7 (-1.1 to -0.26)	0.0020
UEWS-dedication, mean (95%CI)	0.5 (-0.2 to 1.1)	-0.2 (-0.6 to -0.3)	0.10
UEWS-absorption, mean (95%CI)	0.8 (0.2 to 1.4)	-0.4 (-0.8 to -0.1)	0.0022
UWES-total, mean (95%CI)	1.6 (0.2 to 3.1)	-1.2 (-2.3 to -0.1)	0.0048

UWES: the Japanese version of the Utrecht Work Engagement Scale; CI: Confidence Interval.

DISCUSSION

We revealed that the work engagement increased in the group that was supported in terms of their continuation of an exercise program to improve their posture. The change before and after the total UWES scores was 1.6 and -1.2 for the support and control group in this study. There is no report on minimal detectable change for total UWES scores, but the difference in score change was 2.8 points, 5% of the total score. Since the power is 71% at the significance level of 0.05, it is considered that a useful difference has been found in the clinical field. Several studies have demonstrated that lower levels of physical activity may adversely affect productivity⁹⁻¹¹. There is also research that has considered exercise as one means of increasing productivity¹². In this research, Michishita et al. reported that their exercise program improved “vigor” values in work engagement. Their program involved light to moderate intensity exercise that was conducted in the last 10 min of a 45-min lunch break and it could be completed within 10 min.

Our study also found a positive association between support for continuing exercise and work engagement. There was a significant increase for the support group’s work engagement in vigor, absorption, total, but not in dedication. There is a previous study that defines UWES subscales as follows: vigor is a behavioral-energetic, dedication an emotional, and absorption a cognitive component of work engagement, and dedication was presumed to be the prerequisite of vigor and absorption¹³. It is considered that there was no significant increase because “dedication” had different properties. In our study, the exercise program involved exercising for 2 min a day within working hours. Compared with previous studies, the exercise program of this study seems to be easy to introduce because there is not much of a time constraint or feeling of burden. The exercise program was not the only effective aspect; the support system for continuing the exercise may also have been an influence. The feeling of being supported in the workplace has a positive effect mentally, which possibly increased the work engagement.

The present study had some limitations. First, it was conducted in only two facilities; therefore, the generalization of the results is limited. Since each facility was assigned to support and control group, it is probable that the participants knew their assignment. Thus, their expectations and opinions may be biased when answering questions. Second, this was an observational study in which the assignment was not random. Thus, the background of the groups is unequal. We did statistically adjust the background data. However, because they are not randomized, unknown biases cannot be ruled out. Third, only short-term results (2 months) were examined. Further mid- or long-term randomized control studies are required to determine the effect of the exercise program.

In conclusion, the present study examined the effect of the support of workplace units for the continuation of an exercise program for posture improvement on work engagement. After 8 weeks, the work engagement increased in the group that was supported for the continuation of the exercise. These results suggest that the introduction of an exercise program for posture improvement in workplace units can provide a viable means for improving work engagement.

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Conflict of interest

Ko Matsudaira is a share holder and an adviser of Trunk Solution Co., Ltd. Ko Matsudaira received the following support: grant support, including an endowed chair from Sumitomo Dainippon Pharma Co., Ltd. and Okamura Corporation; grant support, including an endowed chair and lecture fees from AYUMI Pharmaceutical Corporation, Nippon Zoki Pharmaceutical Co., Ltd., Ono Pharmaceutical Co., Ltd., Eli Lilly Japan K.K., Astellas Pharma Inc., TOTO Ltd., and Eisai Co., Ltd.; lecture fees from Pfizer Japan Inc., Hisamitsu Pharmaceutical Co., Inc., Janssen Pharmaceutical K.K., Kaken Pharmaceutical Co., Ltd., and Teijin Pharma Limited; and lecture fees and advisory fees from Shionogi & Co., Ltd., outside the submitted work. Hiroyuki Oka received grants from Teijin Pharma Limited, grants from Pfizer Inc., grants from Fujifilm Medical Co., Ltd., grants and personal fees from AYUMI Pharmaceutical Corporation, grants and personal fees from Nippon Zoki Pharmaceutical Co., Ltd., grants and personal fees from Ono Pharmaceutical Co., Ltd., grants from Eli Lilly Japan K.K. and Murata Manufacturing Co., Ltd. outside the submitted work. Other authors have no conflicts of interest to declare.

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