

# Effect of management training in organizational justice: a randomized controlled trial

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*Received September 1, 2015 and accepted January 5, 2016*

*Published online in J-STAGE February 10, 2016*

**Abstract:** Organizational justice (OJ) influences the well-being of employees of organizations. We conducted a randomized controlled trial to examine whether or not brief management training increases OJ for subordinates. Study participants were managers and subordinates working in the private manufacturing sector. Randomization at the departmental level generated an intervention group of 23 departments (93 managers and 248 subordinates) and a control group of 23 departments (91 managers and 314 subordinates). Managers in the intervention group received a 90-min training session to investigate the attitudes and behavior of managers and help increase OJ. Subordinates completed self-administered OJ questionnaire surveys on procedural, interpersonal, and informational justice before and 3 months after intervention. For all subordinates, the interaction between group and time in OJ scores obtained before and 3 months after intervention were not significant. However, in subgroup analyses of the lowest tertile group in relation to the baseline of each of the three OJ subscales and total scores, the lowest tertile group of the interpersonal justice subscale showed significant improvement. The results of this study suggest that brief management training in OJ for managers significantly improves a low rating from subordinates in interpersonal justice. Further studies are required to develop a specific intervention method to increase OJ.

**Key words:** Organizational justice, Workplace, Manager, Subordinates, Education, Randomized controlled trial

## Introduction

Organizational factors strongly influence the health and well-being of employees. To relate the well-being of employees to organizational factors, Karasek developed the job demand-control (social support) model<sup>1</sup>, while Siegrist advocated the effort-reward imbalance model<sup>2</sup>. Recently, the concept of organizational justice (OJ) has attracted particular attention<sup>3–5</sup>.

The term “organizational justice” was first introduced

by Greenberg to indicate the idea of “justice perceived by individuals in organizations”, and the concept of OJ is based on equity theory as developed by Adams<sup>6, 7</sup>. Colquitt subsequently proposed that four scales be used to measure OJ, as follows: distributive justice (justice in the allocation of outcomes such as rewards and evaluation), procedural justice (justice in the decision-making process), interpersonal justice (justice in interpersonal treatment by decision makers), and informational justice (justice in information allocation performed by decision makers)<sup>8</sup>. Until 2003, most studies focused on theoretical or cross-sectional analyses. However, since then, a large number of cohort studies have investigated the relationship between OJ and various outcomes. High OJ is reported to reduce the prevalence

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of coronary diseases<sup>9</sup>), mortality<sup>10</sup>), and risk of metabolic syndrome<sup>11</sup>). Conversely, low OJ is reportedly related to a long-term increase in the levels of inflammatory response markers<sup>12</sup>). OJ might exert a positive influence on psychological factors such as job satisfaction, organizational commitment, trust, organizational citizenship behavior, and employee performance<sup>13, 14</sup>). Further, OJ might be related to minor psychiatric morbidity, medically-certified work absence<sup>15</sup>), and long-term work absence due to diagnosed mental disorders<sup>16</sup>). These results suggest that OJ exerts a large influence on individual employees and organizations and management training in OJ is required.

However, few intervention studies have examined the effectiveness of management training in OJ programs<sup>17</sup>). For example, only three studies have reported the effectiveness of interventions to increase OJ, all of which were conducted by some experts and within trade union organizations, not private sector organizations<sup>18–20</sup>). Further, the training programs assessed were intensive and composed of 4 to 5 sessions, each lasting several to 12 hours. However, training programs such as these that requires substantial time and involvement by experts might be difficult to implement in the private sector. In addition, two studies<sup>18, 19</sup>) adopted a quasi-experimental design and were not randomized control trials.

Here, we conducted a randomized controlled trial (RCT) to examine the effectiveness of one short session of management training to improve OJ for subordinates within private sector organizations. A previous RCT in occupational field found no significant effect on all-participant analysis but did detect significance in high-risk subgroup analysis<sup>21</sup>). However, two approaches have been proposed for educational intervention targeting whole populations versus high-risk groups, both of which are indispensable in the workplace<sup>22</sup>). Therefore, we examined whether hypothesized that our OJ training improve OJ not only for the subordinates who rated baseline OJ in their organization as low, but also for all the subordinates.

## Subjects and Methods

### *Participants and procedure*

This study was conducted in Tokyo, Japan, in a private sector organization that mainly operates in the field of manufacturing. At the time of the study (September 2012), 204 managers from the participating business site supervised a total of 46 departments. Only individuals who managed more than one department or who had no direct subordinates were excluded. Informed consent was obtained from

the remaining managers working in the 46 departments.

Randomization at the departmental level generated an intervention group of 23 departments receiving management training in OJ, and a control group of 23 departments. Subordinates evaluated workplace OJ by completing self-administered questionnaire surveys relating to OJ before and at 3 months after intervention. OJ levels as evaluated by the subordinates in the intervention group were compared to those in the control group. To guarantee data security, surveys were completed on the corporate intranet.

Participants were contacted via e-mail to explain the aims and procedure of the study and were allowed to refuse participation in the study with no consequence. This study was conducted with the approval of the health and safety committee of the private sector organization and the ethics committee of Fukuoka University. For ethical reasons, the control group received the same management training as the intervention group after study completion.

### *Randomization and masking*

An independent researcher who had no direct contact with the participants used computer-generated randomization at the department level with a 1:1 ratio and block size of 4. No stratification was performed, and evaluators were masked. Owing to the nature of the intervention, participants were informed of their allocation status.

### *Intervention*

Prior to management training, an occupational physician from the organization received a 5-h teaching session from an expert in organizational behavior. The physician then conducted management training in OJ for the intervention group to increase OJ. Training sessions with identical content were conducted 3 times during December 2012 and January 2013. Training sessions lasted approximately 90 min and took place during working hours. Managers in the intervention groups participated in one of the most convenient sessions.

Table 1 shows an overview of the training content. Training consisted of a lecture, group discussions, and role-play activities to encourage all participants to explore manager attitudes and behavior to increase OJ. As an introduction to the lecture, the necessity and aims of management training to increase OJ was explained. Three of the four Colquitt factors of OJ (procedural justice, interpersonal justice, and informational justice) were described in detail using specific examples. Distributive justice was mentioned but not described in detail, as final decisions regarding remuneration for subordinates and personnel evaluation were made

**Table 1. Manager group training to promote organizational justice for subordinates**

Program (time required)	Content
Introduction (10 min)	Lecturer asked participants the necessity and purpose of supervisory training on organizational justice (OJ) as an icebreaker for small groups.
Basic information on OJ (10 min)	Lecturer introduced general effects of OJ in prior studies. Participants confirmed common understanding of “fairness”. Participants then identified OJ issues in their own workplace and shared brief ideas for solutions.
Main lecture (15 min)	Lecturer illustrated advisable examples of daily actions with justice regarding each OJ element: <i>Distributive justice</i> , <i>Procedural justice</i> , <i>Interpersonal justice</i> , and <i>Informational justice</i> .
Main group discussion (15 min)	Participants classified their OJ issues and solutions into four categories of OJ and discussed further countermeasures.
Comprehension check of role play (30 min)	Lecturer set a common scene at a workplace, and participants of each group were divided into 3 roles: manager, subordinate, and observer. Observers verified whether the manager acted fairly during the role play.
Conclusion (10 min)	Lecturer summarized and concluded the session, and participants shared their overall impressions of the training.

in the human resources department of this organization.

For procedural justice, managers received a lecture on the importance of giving subordinates opportunities to express their own opinions and feelings in evaluation processes. For interpersonal justice, the importance of respecting and communicating politely with subordinates and awareness of appropriate language usage was emphasized. For informational justice, managers were educated on the importance of presenting the information required by subordinates in a timely, open, and logical manner. Managers were asked to present their experiences in managing subordinates with respect to issues of justice. They then participated in discussions regarding specific ideas to improve problems related to procedural, interpersonal, and informational justice. Finally, participants took part in role-playing activities, taking turns in the manager, subordinate, and observer roles in the context of a manager having a regular interview with his or her subordinates regarding their evaluation. Those who took the roles of subordinates and evaluated aspects of the speech content or attitudes of those playing the manager and participants then exchanged their opinions on points needing improvement.

#### *Outcome measurement*

The Japanese version of the Organizational Justice Scale (OJS-J) was used<sup>23</sup>. The original OJS, developed by Colquitt, is a 21-item self-administered questionnaire designed to measure the four dimensions of distributive, procedural, interpersonal, and informational justice with clear, factor-based validity<sup>8</sup>. Confirmatory factor analysis ensured that the factor structure of the OJS-J was identical to that of the original subscales. Further, internal consistency, test-retest viability, and construct validity of the translated scale are all also high.

Three of the four OJS-J subscales were used to evaluate outcomes in this study: procedural justice (7 items), interpersonal justice (4 items), and informational justice (5 items). Distributive justice was excluded from the evaluation because, as above, the personnel department of the observed company makes the final decision regarding the earnings and work evaluations of subordinates, with most subordinates tending to regard distributive justice as depending on evaluation by the personnel department, not managers. A 5-point Likert scale was used to rate each OJS-J questionnaire item, with high scores indicating high levels of OJ. Scores ranged from 7–35 for procedural justice, 4–20 for interpersonal justice, and 5–25 for informational justice. Internal consistency reliability of OJS-J at baseline in the present study as assessed using Cronbach’s  $\alpha$  was as follows: procedural justice (0.92), interpersonal justice (0.87), and informational justice (0.89). The overall value was 0.94.

To evaluate the quality of training contents, we distributed complementary self-reported questionnaire surveys to all managers in the intervention group immediately following the training. The questionnaires were newly developed by our team with reference to Kirkpatrick’s training evaluation model<sup>24</sup>, which included questions about reactions (“*Are you generally satisfied with today’s training?*”), learning (“*Do you understand the concept of OJ?*”), behavior (“*Can you put OJ into practice in your workplace?*”), and lecturer evaluation (“*Was the skill of lecturer high enough to achieve the objectives of today’s training?*”). A 5-point Likert scale was used to rate each item, with high scores indicating favorable answers (from 1 point, “strongly disagree”; to 5 points, “strongly agree”).

### Statistical analysis

To calculate the sample size,  $\alpha$  was set at 0.05 and  $\beta$  at 0.20. Effect size in post-intervention OJ improvement was estimated as 0.25, which was slightly lower than that used in a previous high-density study<sup>18</sup>. Sample sizes were estimated as 253 for both the intervention and control groups.

Statistical analysis was conducted based on an intention-to-treat (ITT) principle. The rate of missing outcomes was 3.4% across the follow-up period. To satisfy the ITT requirement that analyses be conducted for all participants, a multiple imputation (MI) method was used on the assumption that data could be considered missing at random. MI allows for uncertainty caused by missing data by generating several different plausible imputed data sets using a set of external covariates and appropriately combining results obtained from each<sup>25, 26</sup>. We utilized a sequential regression approach to generate 20 imputations for each missing value, as recommended by Graham JW<sup>27</sup>.

The intervention effect was evaluated by investigating the significance of the interaction between group and time using the mixed-effects models. The mixed-effects model permits adding random cluster effects to account for the correlation of responses expected among subordinates within departments that occurs as a result of the design of the study. Further, as an adjustment factor, the baseline outcome value was added to the model. We did not check who was the boss of any given subordinate, so we were unable to account for the correlation of responses within managers.

Interactions between group and time in each of the three OJ subscale scores and total scores were analyzed for all subordinate participants through a population approach. In addition, we conducted subgroup analysis through a high-risk approach. Given that no cut-off point for the OJ scale has yet been established, we identified high-risk groups by considering baseline OJ data. As a large proportion of outcome data was distributed around the median, we deemed it appropriate to divide the values into tertiles. The interactions between group and time in the lowest tertile group, in which subordinates rated baseline OJ in their organization as low, were investigated for all three OJ subscales and total scores.

To analyze baseline characteristics of the study participants, the following information was collected at baseline: age, gender, marital status, education, occupational status, type of occupation, hours of overtime per month (hours beyond regular working hours [160 h/month]), mean hours of sleep, drinking habit, current smoking habit, exercise habit, and history of psychiatric disorders. A t-test was used

for numerical variables, and a  $\chi^2$ -test for categorical variables. Statistical significance was set at  $p < 0.05$ . IBM SPSS Statistics 22 and IBM SPSS Missing Values 22 (IBM Corp, Armonk, NY, USA) were used for statistical analyses.

## Results

Figure 1 shows the study flow. Informed consent was obtained from 184 managers working in the 46 departments, and 562 subordinates consented to participate in the study. Randomization at the departmental level generated an intervention group of 23 departments and a control group of 23 departments. Of 93 managers in the intervention group, 87 (93.5%) received management training in OJ. A self-administered survey conducted 3 months after intervention as follow-up was completed by 240 subordinates (96.8%) in the intervention group and by 303 (96.5%) in the control group.

Table 2 shows the characteristics of departments, managers, and subordinates in each group. The mean number of managers per department was 4.0 (range; 1–17). Basic attributes of subordinates were generally similar between groups, but significant differences were noted in age, overtime hours, drinking habits, and procedural justice.

Table 3 shows the intervention effect using the mixed-effects model. With regard to the results for all subordinates, although the three OJ subscale scores and the total subscale score tended to be higher in the intervention group than in the control group, the interactions between group and time were not significant ( $F_{1, 1096} = 1.05, p = 0.31$ ;  $F_{1, 1096} = 0.45, p = 0.50$ ;  $F_{1, 1096} = 0.01, p = 0.93$ ;  $F_{1, 1096} = 0.15, p = 0.70$ , respectively). However, with regard to the results of subgroup analyses in the lowest tertile group in relation to the baseline of each of the three OJ subscales and total scores, the lowest tertile of the interpersonal justice subscale showed significant improvement after intervention, with significant interaction between group and time ( $F_{1, 416} = 4.36, p = 0.037$ ). The lowest tertiles of other subscales and overall values did not show significant interaction between group and time ( $F_{1, 374} = 0.20, p = 0.65$ ;  $F_{1, 390} = 0.14, p = 0.71$ ;  $F_{1, 369} = 1.48, p = 0.23$ , respectively). Further, the above results were similar to those after adjustment for age, number of overtime hours, and drinking habit in addition to baseline outcome score.

On analysis of the complementary questionnaires distributed to managers in the intervention group, mean scores (SD) of each item across all three sessions were as follows: “Reaction” 4.34 (0.71), “Learning” 4.49 (0.61), “Behavior” 3.91 (0.77), and “Lecturer evaluation” 4.76 (0.53). In the

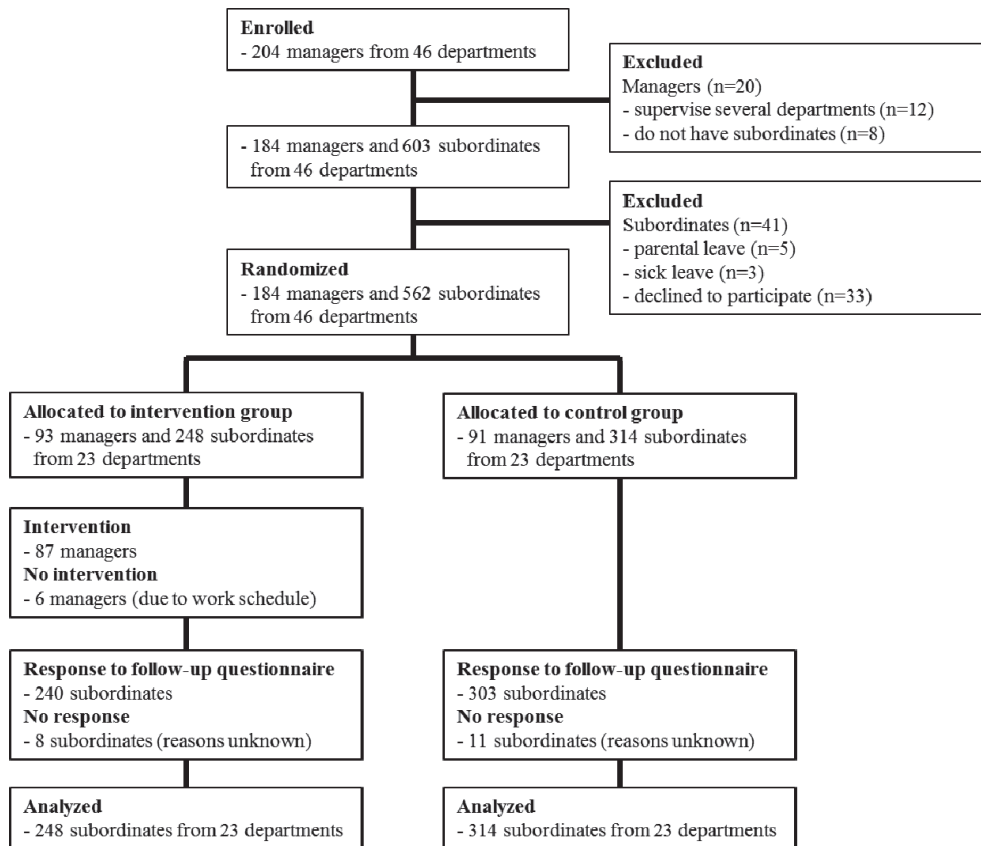


Fig. 1. Study flow

present study, the same lecturer helmed all 3 sessions, and the respective scores for the first, second, and third sessions were as follows: “Reaction” 4.53 (0.66), 4.22 (0.77), 4.25 (0.46); “Learning” 4.47 (0.62), 4.53 (0.59), 4.38 (0.74); “Behavior” 3.94 (0.74), 3.87 (0.79), 4.00 (0.93); and “Lecturer evaluation” 4.79 (0.41), 4.71 (0.63), 4.88 (0.35). No statistical differences were noted between sessions (“Reaction”  $F_2=1.92$ ,  $p=0.15$ , “Learning”  $F_2=0.27$ ,  $p=0.77$ , “Behavior”  $F_2=0.15$ ,  $p=0.86$ , “Lecturer evaluation”  $F_2=0.45$ ,  $p=0.64$ ).

## Discussion

Brief management training failed to significantly increase OJ evaluated by all the subordinates. However, in the intervention group, a significant increase in interpersonal justice scores was observed in subordinates who had rated interpersonal justice in their organization as low.

A cohort study conducted in the UK showed high three- and six-year incidence of poor mental health among subordinates who felt unfairly treated by their managers at baseline<sup>28</sup>). Treatment of subordinates by managers is reported to play the most significant role in dictating perception of

organizational justice<sup>29</sup>). Further, interpersonal justice combined with informational justice is reported to be a stronger predictor of onset of depression within 2 years<sup>30</sup>) and is more strongly associated with organizational citizenship behavior and cohesion than other OJ subscales<sup>31</sup>). Taking these findings into consideration and from the perspective of organizational management, we believe the present findings of improved interpersonal justice to be significant, despite the relatively small effect size.

The management training in OJ used in the present study is a highly practical method that requires a relatively short time and only a single class, which is appropriate for private companies that cannot spare much time for training. Given that previous training methods required several days to complete educational intervention<sup>18–20</sup>), shorter interventions are required to improve feasibility for private companies. The present training method is brief, requiring only 90 min, and is simple enough to be attended by busy managers, as shown by the high 93.5% attendance rate in the intervention group in this study.

In the complementary survey, managers described the quality of our training as high, possibly because our training program was provided by an occupational physician

**Table 2. Baseline characteristics of participants**

	Total		Intervention group		Control group		<i>p</i> <sup>1)</sup>
<b>Departments</b>	<b>n=46</b>		<b>n=23</b>		<b>n=23</b>		
Number of managers, mean (SD, range)	4.0	(3.0, 1–17)	4.0	(3.5, 1–17)	4.0	(2.6, 1–9)	0.92
Number of subordinates, mean (SD, range)	12.2	(12.6, 1–66)	10.8	(10.2, 1–42)	13.7	(14.7, 3–66)	0.45
<b>Managers</b>	<b>n=184</b>		<b>n=93</b>		<b>n=91</b>		
Age (years), mean (SD)	46.1	(5.1)	46.3	(5.2)	45.9	(5.0)	0.56
Gender, males, n (%)	181	(98.4)	92	(98.9)	89	(97.8)	0.55
<b>Subordinates</b>	<b>n=562</b>		<b>n=248</b>		<b>n=314</b>		
Age (years), mean (SD)	40.7	(11.5)	42.2	(11.3)	39.5	(11.5)	0.01
Gender, males, n (%)	480	(85.4)	208	(83.9)	272	(86.6)	0.36
Marital status, n (%)							
Married	317	(56.4)	147	(59.3)	170	(54.1)	0.22
Single	245	(43.6)	101	(40.7)	144	(45.9)	
Highest level of education, n (%)							
High school	173	(30.8)	87	(35.1)	86	(27.4)	0.06
Vocational school	64	(11.4)	34	(13.7)	30	(9.6)	
Junior college	31	(5.5)	14	(5.6)	17	(5.4)	
College/University	97	(17.3)	35	(14.1)	62	(19.7)	
Graduate degree or higher	197	(35.1)	78	(31.5)	119	(37.9)	
Occupational status, n (%)							
Assistant manager	96	(17.1)	47	(19.0)	49	(15.6)	0.56
Rank-and-file employee	403	(71.7)	173	(69.8)	230	(73.2)	
Re-employed senior employee	34	(6.0)	17	(6.9)	17	(5.4)	
Others	29	(5.2)	11	(4.4)	18	(5.7)	
Occupation, n (%)							
Technician	197	(35.1)	93	(37.5)	104	(33.1)	0.15
General clerk	294	(52.3)	131	(52.8)	163	(51.9)	
Others	71	(12.6)	24	(9.7)	47	(15.0)	
Hours of overtime, h/month <sup>2)</sup> , n (%)							
<20	227	(40.4)	123	(49.6)	104	(33.1)	0.01
20 to <45	267	(47.5)	105	(42.3)	162	(51.6)	
≥45	68	(12.1)	20	(8.1)	48	(15.3)	
Mean hours of sleep, h/day, n (%)							
<5	138	(24.6)	59	(23.8)	79	(25.2)	0.23
5 to <6	267	(47.5)	109	(44.0)	158	(50.3)	
6 to <7	125	(22.2)	63	(25.4)	62	(19.7)	
≥7	32	(5.7)	17	(6.9)	15	(4.8)	
Alcohol intake							
Almost daily	116	(20.6)	54	(21.8)	62	(19.7)	0.02
Few times per week	231	(41.1)	86	(34.7)	145	(46.2)	
None	215	(38.3)	108	(43.5)	107	(34.1)	
Current smoking habit							
Yes	143	(25.4)	67	(27.0)	76	(24.2)	0.45
No	419	(74.6)	181	(73.0)	238	(75.8)	
Exercise habit							
Yes	191	(34.0)	92	(37.1)	99	(31.5)	0.17
No	371	(66.0)	156	(62.9)	215	(68.5)	
History of psychiatric disorders							
Yes	20	(3.6)	11	(4.4)	9	(2.9)	0.32
No	542	(96.4)	237	(95.6)	305	(97.1)	
<i>OJ scores at baseline</i>							
Procedure justice, mean (SD)	23.8	(4.7)	23.3	(4.8)	24.2	(4.6)	0.03
Interpersonal justice, mean (SD)	15.8	(2.7)	15.7	(2.5)	15.8	(2.8)	0.85
Informational justice, mean (SD)	18.3	(3.6)	18.2	(3.6)	18.4	(3.7)	0.61
Total scores of three OJ subscales, mean (SD)	57.8	(9.6)	57.2	(9.3)	58.3	(9.8)	0.20

SD, standard deviation

<sup>1)</sup>t-test was used for numerical variables and a  $\chi^2$ -test for categorical variables.<sup>2)</sup>Overtime (over 160 h/month)

**Table 3. Results of intervention effects of each of three subscales scores and total of three OJ subscale scores before and after intervention**

	Number analyzed		Mean change (SE)		Difference (95% CI)	Interaction between group and time <sup>1)</sup>
	Intervention group	Control group	Intervention group	Control group		
Procedure justice						
All subordinates	n=248	n=314	0.08 (0.27)	-0.26 (0.23)	0.35 (-0.36, 1.05)	0.31
Lowest tertile group (baseline score ≤21)	n=94	n=100	1.49 (0.54)	1.16 (0.50)	0.33 (-1.12, 1.78)	0.65
Interpersonal justice						
All subordinates	n=248	n=314	0.11 (0.15)	-0.01 (0.12)	0.12 (-0.26, 0.50)	0.50
Lowest tertile group (baseline score ≤15)	n=98	n=118	0.90 (0.24)	0.24 (0.23)	0.66 (0.01, 1.32)	0.04
Informational justice						
All subordinates	n=248	n=314	-0.04 (0.18)	-0.06 (0.15)	0.02 (-0.45, 0.49)	0.93
Lowest tertile group (baseline score ≤17)	n=88	n=113	0.91 (0.35)	0.74 (0.29)	0.17 (-0.72, 1.06)	0.71
Total scores of three OJ subscales						
All subordinates	n=248	n=314	0.16 (0.45)	-0.33 (0.41)	0.49 (-0.71, 1.68)	0.70
Lowest tertile group (baseline score ≤54)	n=86	n=103	1.52 (0.90)	1.13 (0.89)	0.39 (-1.97, 2.88)	0.23

SE, standard error of mean; CI, confidence interval

<sup>1)</sup> *p* value assessed using mixed-effects models adjusted for the design effect including departments as random cluster effects and baseline outcome scores.

using a “train-the-trainer” approach<sup>32)</sup>. This particular approach involves knowledge- and skill-based training delivered by a professional instructor that creates a trainer (the occupational physician in this study) who is capable of providing basic comprehensive workplace health training to employers. Although time was required for the occupational physician to learn organizational psychology from the expert before intervention to improve her understanding of OJ, she was able to provide the training class almost unassisted. Occupational physicians, each belonging to a single organization, are generally familiar with training classes for employees and managers and thus how to guide group discussion and role-play. For this reason, the physician in the present study was able to complete the training to the full satisfaction of managers.

However, due to the simplicity of this training, outcomes might be less beneficial or more limited than anticipated, as in the present study. Further study is therefore required to establish a training intervention with an optimal balance between simplicity and effectiveness. The present training did not significantly improve procedural or informational justice. Generation of a significant change in procedural justice after a brief training class might be difficult, as procedural justice reflects the assessment of high-level authorities or the entire organization rather than immediate managers<sup>33)</sup>. Educating company executives on OJ might there improve procedural justice as well as the personnel assessment system. Interpersonal justice and informational justice are two elements required to build relationships with managers. Interpersonal justice includes items related to respect and propriety, while informational justice includes truthful-

ness and justification<sup>8)</sup>. In Japan, ambiguity in communication is accepted as normal due to a cultural background that prizes nonverbal communication. Therefore, implementing the concept of informational justice, which promotes frank, direct, and clear communication might have been difficult. However, interpersonal justice, emphasizing respect and propriety, is a common concept in Japan. In addition, the timing of the follow-up survey in our study coincided with annual personnel changes in Japan. Given that reasons for transfer can be vaguely presented, some subordinates may have felt more frustrated than usual at this point, and the effect of intervention might have been alleviated.

To improve the health and well-being of workers and increase organizational productivity, the provision of multiple interventions to the organization as a whole rather than to individual workers is required, as well as assessment of the effect of intervention<sup>34)</sup>. OJ is an important organizational factor, and a low level of OJ is associated with intense stress and can induce negative physiological and behavioral responses among workers<sup>35)</sup>. As a practical measure to improve OJ, organizations are expected to provide training programs to promote fair management skills among managers<sup>28, 36)</sup>. We anticipate more intervention studies using various methods of management training in the future.

The present study has several limitations. Given that the study investigated office workers in a manufacturing company with a high proportion of men, studies focusing on companies with different characteristics might have different results. In addition, as awareness of OJ reflects sociocultural backgrounds, the results of this study might

not be generalizable to organizations with different backgrounds. This study did not reveal any long-term benefits of the intervention or changes that may result from improving OJ, such as improved subordinate well-being or organizational productivity. We did not account for nesting at the manager level in the analysis, which could have affected the accuracy of statistical results. Further, although subordinates were not informed as to whether their boss was in the intervention group or not, managers may have unintentionally disclosed their involvement in OJ training to their subordinates, given the close proximity in which managers and subordinates work. In addition, contents of the training might have been shared between managers in the intervention and control groups, which may have influenced the intervention effect. The self-descriptive and non-objective assessment index might be another limitation. However, OJ should be evaluated with an emphasis on the subjective judgments of the individual with regard to fairness<sup>37</sup>.

## Conclusions

The findings of this study suggest that a brief OJ training for managers significantly improves a low rating from subordinates in interpersonal justice. Intervention at the organization level is clearly needed to improve the health and well-being of individual workers as well as the productivity of the organization. Although the provision of interventions to improve OJ appears to achieve this aim, further studies are needed to develop a specific intervention method.

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