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# Feasibility and Acceptability of Policies and Environmental Strategies for Improving Physical Activity and Healthy Eating in Japanese Small and Medium Corporations

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**Objective:** We assessed the implementation status of policies and environmental strategies for increasing physical activity (PA) and healthy eating (HE) in small and medium corporations to identify feasible and acceptable interventions. **Methods:** An anonymous self-administered questionnaire was administered to 655 small and medium corporations to determine whether they implemented PA (18 items) and HE (17 items) policies and environmental strategies and, if not, their intention to do so in the future. We compared differences in the implementation and intention to implement rate by corporation size. **Results:** The implementation and intention rates of costly items for PA and HE were low, regardless of corporation size, but were significantly lower in small corporations than in medium corporations. **Conclusions:** To overcome cost barriers, employee participation must be encouraged, and employee knowledge of PA and HE must be improved.

**Keywords:** acceptability, feasibility, healthy eating, physical activity, policies and environmental strategies, workplace

Being overweight or obese is a serious health problem due to an increased risk of lifestyle-related diseases, such as diabetes, and early death. In 2016, almost half of adults worldwide were either overweight or obese.<sup>1</sup> Similarly, in Japan, one in three adult men and one in five adult women are overweight or obese.<sup>2</sup> Because many adults are workers and spend their time at workplaces, health support in workplaces is important and effective in maintaining and promoting the health of workers.

Effective measures include not only providing individual behavioral change strategies but also changing the office environment and policies for weight loss and weight management.<sup>3-6</sup> Improvement of both physical activity (PA) and healthy eating (HE) is essential for weight control. Previous studies have revealed effective environments and policies for increasing PA, such as active commuting interventions,<sup>5,7</sup> using incentives, using stairs, providing facilities or rented local organizations, and shower and locker facilities.<sup>8</sup> Furthermore, a conducive environment and policies for improving HE, such as

healthy meal choices in cafeterias and vending machines,<sup>5</sup> educational information on healthy menus,<sup>8</sup> and labelling calorie content,<sup>9</sup> are effective in doing so. In an article that assessed available measures of workplace environmental and policy supports for PA and HA, the most common strategies for PA were counseling/classes/education and access to PA equipment, lockers, and showers; the most common strategies for HE were healthy options on-site, vending machines, informational media, and nutrition labeling.<sup>10</sup>

The health and productivity management movement in Japan, which involves corporations supporting employee health, are expanding to large corporations but have not been sufficiently implemented in small and medium corporations because of lack of financial and human resources.<sup>11</sup> We plan to develop a weight-loss program, combining individual interventions with policies and environmental interventions for small and medium corporations. Although many interventions have revealed effective policies and environmental strategies, their acceptability and feasibility remain unclear.<sup>3</sup> Thus, the acceptability and feasibility of strategies for increasing PA and HE at workplaces must be verified for developing appropriate environmental interventions. Qualitative studies have shown that cost, productivity, and impracticality are barriers to implementing policies and environmental strategies to reduce sitting time at workplaces.<sup>12,13</sup> In contrast, low-cost strategies to reduce sitting time are perceived as feasible and acceptable.<sup>13</sup> A qualitative study that elicited staff views and experiences about promoting HE at the workplace reported limited availability of affordable healthy choices and time constraints as barriers.<sup>14</sup> Another study of interventions that provided price incentives and healthy choices at the workplace reported that continuing interventions required money.<sup>15</sup> Therefore, financial concerns were common barriers to promoting policies and environmental strategies for PA and HE at the workplace. Because small and medium corporations may not have enough human and financial resources, it may not be acceptable and feasible for them to implement policies and environmental strategies, including those that have been confirmed to be effective for workplaces in previous experimental studies.

In addition, in many intervention studies, sustainability and translation into practice after intervention trials have not been considered.<sup>12</sup> Furthermore, several studies have qualitatively identified workers' and managers' perceptions of the acceptability and feasibility of strategies for increasing PA and HE at the workplace.<sup>12-16</sup> However, few studies have quantitatively described the implementation status of policies and environmental strategies in small and medium corporations. Thus, this study aimed to assess the implementation status of policies and environmental strategies for improving PA and HE in small and medium corporations to clarify feasible and acceptable strategies for intervention development. To this end, we targeted small and medium corporations that have engaged in organizational strategies for health promotion at the workplace.

## METHODS

### Study Design and Subjects

We conducted a cross-sectional questionnaire-based survey to assess the implementation status and implementation intention of

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The survey was conducted using an unmarked self-administered questionnaire. A letter requesting research cooperation was enclosed with the questionnaire, and the return of the questionnaire was regarded as consent.

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policies and environmental strategies for promoting PA and HE in small and medium corporations. Of the 26,000 small and medium corporations that joined the Japan Health Insurance Association Branch A (JHIA-A), 655 corporations that participated in the Healthy Declaration Program—a health support program that the JHIA-A provides to joined corporations—were chosen as subjects. First, a corporation that intends to participate in the Healthy Declaration Program fills out the Health Degree Check Sheet. Subsequently, they declare that they will engage in policies and environmental strategies for health promotion activities, such as HE, PA, smoking cessation, and mental health, in the Manifesto Sheet based on advice from the booklet provided by the JHIA-A. It is left to the discretion of each corporation as to how specific the methods of the strategies they intend to implement are, although health professionals of the JHIA-A support them in deciding the policies and environmental strategies for improving PA and HE. The JHIA-A authorizes corporations that meet the criteria of excellent health promotion offices based on the submitted sheets.

We mailed an anonymous self-administered questionnaire to each corporation and asked the person who engaged in the health management of workers to complete it. The questionnaires were collected by mail. The survey period was from February to March 2020.

## MEASURES

### Basic Information of Corporations

Information regarding number of employees, the type of business, position of the respondents, and the reasons they decided to participate in the Healthy Declaration Program was obtained as basic information. Respondents were asked to choose their industry from a list of 24 items as defined by the Japan Standard Industrial Classification. In addition, respondents chose one of three positions: business owner, health supervisor or health promoter, and others. Health supervisors and health promoters are industrial hygiene staff unique to Japan who engage in the improvement of health and safety levels in the workplace, and their qualifications, duties, and appointment criteria are defined in the Industrial Safety and Health Act. Employers are required to appoint a health supervisor or a health promoter depending on the size of the workplace. Specifically, workplaces with 50 or more employees are required to appoint health supervisors. Workplaces with 10 to 49 employees are required to appoint a health promoter. Workplaces with less than 10 employees do not have these requirements. Health supervisors are licensed as physicians or other health professionals and are expected to have more specialized duties regarding safety and health in the workplace. They are responsible for regular patrols of the workplace to prevent employee health problems. Health promoters are required to complete a training course conducted by a person certified by the director of the prefectural Labor Bureau. Their duties include managing employees to maintain their health and create a safe and sanitary environment at the workplace. We asked respondents to choose multiple answers from a list of six multiple-response options regarding their opportunity to participate in the Healthy Declaration Program.

### Policies and Environmental Strategies

Items of policies and environmental strategies included 18 items on PA and 17 items on HE. This was based on previous research that clarified assessment tools for workplace support for PA and HE<sup>10,17-21</sup> and a review of workplace interventions for PA and HE.<sup>3,5,8,22,23</sup> The items were categorized into promotion and program, organizational policies and practice, physical environment, and social environment, based on a previous study.<sup>10</sup> We confirmed that these items did not deviate from the advice and support provided by the JHIA-A. Feasibility was defined as the realism of the policies and strategies and acceptability was defined as the likelihood that the policies and strategies would be accepted in the future. We asked

respondents whether they were implementing these items at the workplace. If their answer implied that the item was not being implemented, we asked them about their implementation intention by asking “Do you want to implement it in the future?” Items with a high implementation rate were considered highly feasible and items with a high implementation intention rate (not currently implemented) were considered highly acceptable.

Furthermore, we obtained information about any workplace strategies other than the ones we mentioned in the form of free-form answers.

### Analysis

We aggregated the implementation and implementation intentions of each item of the policies and environmental strategies. In addition, we compared the differences in the implementation status and implementation intention rate by corporation size using Fisher exact test. Regarding classification of corporation size, corporations with less than 50 employees were classified as small corporations and those with 50 employees or more were classified as medium corporations. The reason for this classification is that the Occupational Safety and Health Act requires corporations with 50 or more employees to appoint a health supervisor and an industrial physician, which affects the implementation of health promotion at workplaces. Statistical analyses were performed using SPSS 22.0. The level of statistical significance was set at 5%.

The data from the free-form answers were cross compared to identify key themes. First, one researcher identified codes and categorized similar codes. These categorized codes were assigned themes. Other researchers checked the credibility of the data analysis.

## ETHICAL APPROVAL

We asked the subjects to answer an anonymous self-administered questionnaire through written request. Returning the questionnaire was considered consent to participate in the study. Ethical approval was granted by the research ethics committee at Nagoya City University, Graduate School of Nursing (ID19018-4).

## RESULTS

### Overview of Corporations

Overall, 254 corporations (recovery rate, 38.8%) were included in this study. Table 1 displays the characteristics of the corporations in this study. Corporations using less than 50 people accounted for 68.9% of participants and those using more than 50 people accounted for 31.1%. The largest number of corporations fell into the manufacturing (23.8%), construction (16.0%), and medical/welfare (13.9%) industries. The largest number of respondents were health supervisors and health promoters (55.0%). Respondents from small corporations were more likely to be business owners, whereas those in medium corporations were more likely to be health supervisors and health promoters.

### Implementation and Implementation Intention Rate of Policies and Environmental Strategies for Promoting PA

Table 2 displays the implementation and implementation intention rates of policies and environmental strategies for increasing PA. The median implementation rate for all items is 22.8%. The items with the highest implementation rate are items 16 (64.0%), 1 (60.5%), and 3 (34.0%). Eight of the 18 items show significant differences in implementation rates between small and medium corporations. The implementation rates for these items, excluding item 16 and item 15, are lower than the median implementation rate for all items.

**TABLE 1.** Characteristics of Corporations

	All Corporations (N = 254), n (%)	Small Corporations <sup>a</sup> (n = 175), n (%)	Medium Corporations <sup>a</sup> (n = 79), n (%)	P
No. employees				
<10	17 (6.7)			
10–49 people	158 (62.2)			
50–99 people	34 (13.4)			
100–299 people	30 (11.8)			
300–999 people	12 (4.7)			
>1000 people	3 (1.2)			
Industrial classification				
Agriculture and forestry	2 (0.8)	2 (1.2)	0 (0.0)	<0.001 <sup>b</sup>
Fisheries	1 (0.4)	1 (0.6)	0 (0.0)	
Mining and quarrying of stone and gravel	1 (0.4)	0 (0.0)	1 (1.3)	
Construction	39 (16.0)	38 (22.6)	1 (1.3)	
Manufacturing	58 (23.8)	35 (20.8)	23 (30.3)	
Electricity, gas, heat supply, and water	4 (1.6)	3 (1.8)	1 (1.3)	
Information and communications	2 (0.8)	2 (1.2)	0 (0.0)	
Transport and postal activities	22 (9.0)	17 (10.1)	5 (6.6)	
Wholesale and retail trade	31 (12.7)	21 (12.5)	10 (13.2)	
Finance and insurance	1 (0.4)	1 (0.6)	0 (0.0)	
Scientific research; professional and technical services	10 (4.1)	9 (5.4)	1 (1.3)	
Accommodations; eating and drinking services	2 (0.8)	0 (0.0)	2 (2.6)	
Living-related, personal, and amusement services	2 (0.8)	1 (0.6)	1 (1.3)	
Education; learning support	4 (1.6)	1 (0.6)	3 (3.9)	
Medical, health care, and welfare	34 (13.9)	17 (10.1)	17 (22.4)	
Compound services	2 (0.8)	0 (0.0)	2 (2.6)	
Services, not elsewhere classified	20 (8.2)	16 (9.5)	4 (5.3)	
Government, except elsewhere classified	3 (1.2)	1 (0.6)	2 (2.6)	
Industries unable to classify	6 (2.5)	3 (1.7)	3 (3.8)	
Multiple answers	10 (3.9)	7 (4.0)	3 (3.8)	
Respondent's position				
Business owner	54 (21.5)	47 (27.2)	7 (9.0)	0.001 <sup>b</sup>
Health supervisor, health promoter	138 (55.0)	83 (48.0)	55 (70.5)	
Others	59 (23.5)	43 (24.9)	16 (20.5)	
Opportunity to participate in the healthy declaration program (multiple answer)				
Information from the Japan Health Insurance Association	190 (74.8)	129 (73.7)	61 (77.2)	0.640 <sup>c</sup>
Business owner's decision	49 (19.3)	33 (18.9)	16 (20.3)	0.864 <sup>c</sup>
Guidance at a workshop on health management	29 (11.4)	22 (12.6)	7 (8.9)	0.523 <sup>c</sup>
Information on the Japan Health Insurance Association Web site	6 (2.4)	4 (2.3)	2 (2.5)	1.000 <sup>c</sup>
Requests from employees	1 (0.4)	1 (0.6)	0 (0.0)	1.001 <sup>c</sup>
Other reasons	14 (5.5)	10 (5.7)	4 (5.1)	1.000 <sup>c</sup>

<sup>a</sup>Small corporation: The number of employees <50, medium corporation: The number of employees ≥50.

<sup>b</sup>Chi-square test

<sup>c</sup>Fisher exact test.

The median implementation intention rate for all items is 25.4%. The items with the highest implementation intention rate are items 4 (52.1%), 3 (46.7%), and 1 (41.5%). Item 15 shows a significant difference in the implementation intention rate between small and medium corporations. Furthermore, the implementation intention rate for this item is lower than the median intention rate for all items.

The implementation and implementation intention rates of policies and environmental strategies for increasing PA are shown in a scatter plot (Fig. 1). Items 1, 3, and 4 have both high implementation and implementation intention rates. Items 5, 6, 7, 11, and 14 have both low implementation and implementation intention rates. Item 16 has a high implementation but low implementation intention rate.

Five themes were generated from the analysis of data from the free-form answers: “Encourage participation in local sport events and subsidize the cost (n = 5),” “Have sport events at the workplace (n = 4),” “Provide professional support (exercise instructor, nurse) in the workplace (n = 2),” “Provide health measurement devices (sphygmomanometer) in the workplace (n = 1),” and “Encourage participation in local sports clubs (n = 1).”

### Implementation and Implementation Intention Rate of Policies and Environmental Strategies for Promoting HE

Table 3 displays the implementation and implementation intention rates of policies and environmental strategies for increasing HE. The median implementation rate for all items is 24.7%. The items with the highest implementation rates are items 15 (87.6%), 13 (82.9%), and 8 (82.1%). Three of the 17 items show significant differences in implementation rates between small and medium corporations.

The median implementation intention rate for all items is 23.9%. The items with the highest implementation intention rate are items 3 (40.1%), 4 (36.4%), and 17 (34.5%). Item 6 shows a significant difference in the implementation intention rate between small and medium corporations. The implementation intention rate for this item is lower than the median intention rate for all items.

The implementation and implementation intention rates of policies and environmental strategies for increasing HE are shown in a scatter plot (Fig. 2). Item 3 has medium implementation rates

**TABLE 2.** Implementation Rates and Intention Rates of Policies and Environmental Strategies for Increasing PA

Items	No. Corporations That Implemented Each Item			P <sup>b</sup>	No. Corporations That Had the Intention to Implement Each Item			P <sup>b</sup>
	All Corporations (N = 254), n (%)	Small Corporations <sup>a</sup> (n = 175), n (%)	Medium Corporations <sup>a</sup> (n = 79), n (%)		All Corporations, n <sup>c</sup> (%)	Small Corporations, <sup>a</sup> n <sup>c</sup> (%)	Medium Corporations, <sup>a</sup> n <sup>c</sup> (%)	
Promotion and program								
1. Conduct assessments of employee's PA through health checkup, etc	153 (60.5)	106 (60.6)	47 (60.3)	1.000	39 (41.5)	29 (44.6)	10 (34.5)	0.377
2. Plan and provide health educational program (seminars, classes, etc) to promote PA	43 (17.0)	23 (13.1)	20 (25.6)	0.018	68 (35.4)	47 (34.3)	21 (38.2)	0.620
3. Provide educational materials (posters, brochures, pamphlets, etc) on improving PA	86 (34.0)	62 (35.6)	24 (30.8)	0.476	71 (46.7)	50 (49.0)	21 (42.0)	0.490
Organizational policies and practice								
4. General statement by the employer about organizational goals and methods on improving PA	72 (28.8)	50 (28.9)	22 (28.6)	1.000	86 (52.1)	62 (54.9)	24 (46.2)	0.318
5. Subsidize or bear the cost of exercise facilities (gym, fitness, etc)	24 (9.5)	11 (6.3)	13 (16.7)	0.018	44 (20.7)	32 (21.3)	12 (19.0)	0.853
6. Provide exercise equipment, such as pedometers, or financial assistance for purchasing the same	20 (7.9)	11 (6.3)	9 (11.5)	0.206	34 (16.1)	25 (17.0)	9 (14.1)	0.686
7. Provide incentives (rewards, awards, giveaways, etc) for PA (goal achievement, etc)	16 (6.3)	7 (4.0)	9 (11.5)	0.046	34 (15.6)	24 (15.6)	10 (15.6)	1.000
8. Campaigns or competitions to promote PA (encourage to use stairs, etc)	64 (25.3)	41 (23.4)	23 (29.5)	0.348	67 (37.9)	48 (38.4)	19 (36.5)	0.866
9. Conduct exercises and stretching at scheduled times at the workplace	73 (28.9)	46 (26.3)	27 (34.6)	0.180	65 (38.7)	43 (35.8)	22 (45.8)	0.293
10. Have time to exercise individually during working hours	41 (16.2)	29 (16.6)	12 (15.4)	0.856	44 (22.8)	30 (22.6)	14 (23.3)	1.000
11. Make health promotion program available to family members for PA	20 (7.9)	9 (5.1)	11 (14.1)	0.022	30 (12.7)	22 (14.7)	8 (12.7)	0.830
12. Collaborate with community organizations to improve PA	30 (11.9)	15 (8.6)	15 (19.2)	0.020	53 (26.2)	37 (25.3)	16 (28.6)	0.721
Internal physical environment								
13. Create an environment (stairs, passages, workstation, etc) which increases PA in the workplace	63 (24.9)	38 (21.7)	25 (32.1)	0.085	54 (31.0)	34 (27.4)	20 (40.0)	0.147
14. Provide on-site equipment or facilities for PA (machines, walking and running path, etc)	42 (16.7)	29 (16.6)	13 (16.9)	1.000	36 (18.8)	23 (17.4)	13 (22.0)	0.548
15. Provide locker rooms/showers for PA	66 (26.1)	38 (21.7)	28 (35.9)	0.021	28 (15.9)	15 (11.7)	13 (27.1)	0.020
16. Provide environments for commuting on foot or on bicycle (bicycle storage, parking lot outside the workplace, etc)	162 (64.0)	103 (58.9)	59 (75.6)	0.011	19 (22.4)	15 (22.7)	4 (21.1)	1.000
Internal social environment								
17. Support positive interaction between employee for PA (club activity, etc)	57 (22.5)	25 (14.3)	32 (41.0)	<0.001	43 (24.6)	29 (21.8)	14 (33.3)	0.151
18. Have an employee who promotes PA	58 (23.0)	35 (20.1)	23 (29.5)	0.108	65 (37.4)	46 (37.1)	19 (38.0)	1.000
Median	22.8	18.4	29.1		25.4	26.4	31.0	

<sup>a</sup>Small corporation: The number of employees <50, medium corporation: The number of employees ≥50.

<sup>b</sup>Fisher exact test.

<sup>c</sup>The corporations that did not implement each item.

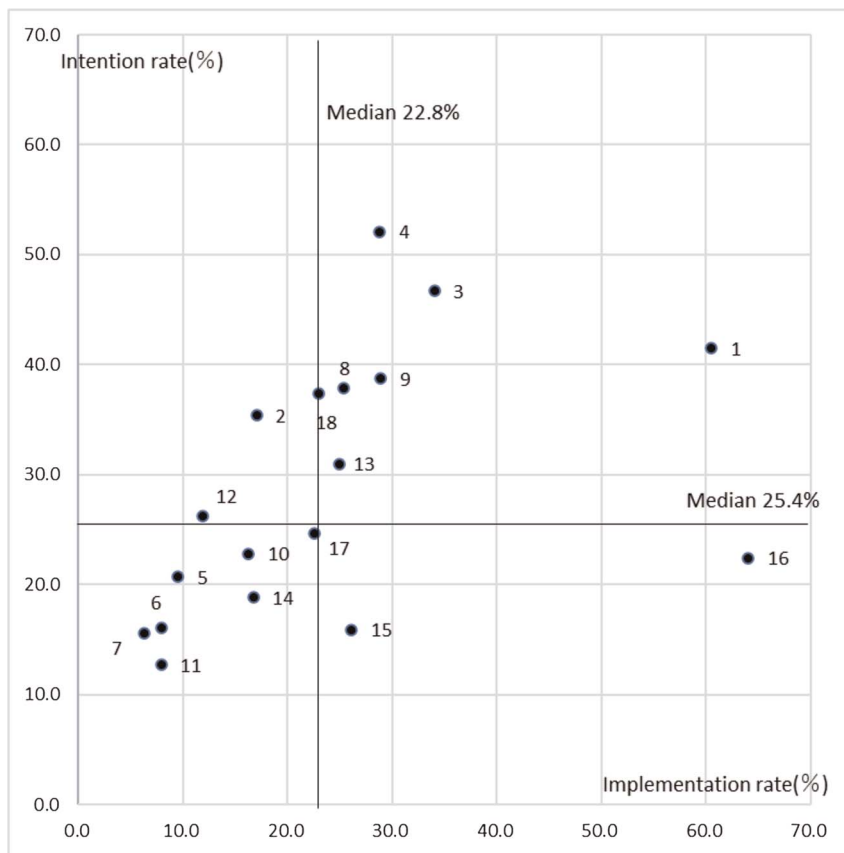


FIGURE 1. Implementation and intention rate of policies and environmental strategies for improving PA.

and high implementation intention rates. Item 4 and item 17 have low implementation but high implementation intention rates.

The analysis of the data from the free-form answers regarding policies and environmental strategies for promoting HE revealed four themes: “Provide healthy foods and drinks in the workplace (n = 7),” “Provide healthy meals during business trips (n = 1),” “Provide healthy meals during meeting (n = 1),” and “Permit employees to go home and eat home-cooked meals during lunch time (n = 1).”

### DISCUSSION

This study clarified the implementation and implementation intention rates of policies and environmental strategies for increasing PA and HE in small and medium corporations that joined the JHIA-A. Because small corporations formed approximately 70% of the subjects included in this study, their implementation and implementation intention rates affected the rates of all corporations. Approximately 30% of respondents in small corporations were business owners. Although small corporations with less than 50 employees are not obligated to appoint a health supervisor, employers are obligated to manage their employees’ health. Thus, in small corporations, the business owners shouldered the responsibility for top management and employee health management and accordingly responded to the study. In addition, half of the respondents from small corporations were health promoters. This indicates that some small corporations do have a key person with a role in health management in the workplace. To support the effective improvement of the workplace environment for health promotion, it is necessary to consider the person involved in the health management of each small and medium corporation.

The items with high implementation and implementation intention rates were considered to have high feasibility and acceptability.

This was because there were few barriers to implementation, and implementation was easy to formulate. Furthermore, such strategies may be disseminated by introducing practical examples and by presenting the ingenuity of corporations that have implemented these in advance. For items with a low or medium implementation but a high implementation intention rate, the implementation rate may be increased by providing support, such as proposing concrete implementation methods and showcasing resources within the community. In terms of items with a high implementation but low implementation intention rate, corporations considered these items important for improving PE and HE and had already implemented them, whereas corporations that did not intend to implement these items felt that they did not meet employee needs or were doubtful of their effect and necessity. Interventions that match employee preferences are important for the effectiveness of interventions.<sup>17</sup> This is because items with low implementation and implementation intention rates are difficult for many corporations to implement, and corporations may consider them ineffective for improving PA and HE. Therefore, an intervention suitable for each corporation must be implemented. Furthermore, sustainable and effective strategies for small and medium corporations must be considered, and support must be provided based on these characteristics.

For example, item “[3] Provide educational materials (posters, brochures, pamphlets, etc) on improving PA/HE” had a relatively high implementation rate and a high implementation intention rate, which was common to both PA and HE. Although providing educational materials improves knowledge, attitudes, and health status,<sup>24,25</sup> it is difficult for small and medium corporations that do not have occupational health professionals to select and provide educational materials, which vary in content and type, to their employees. Therefore, the implementation rate of this item can be further increased by proposing

**TABLE 3.** Implementation Rates and Intention Rates of Policies and Environmental Strategies for Increasing HE

Items	No. Corporations That Implemented Each Item			<i>P</i> <sup>b</sup>	No. Corporations That Had the Intention to Implement Each Item			<i>P</i> <sup>b</sup>
	All Corporations (N = 254), n (%)	Small Corporations <sup>a</sup> (n = 175), n (%)	Medium Corporations <sup>a</sup> (n = 79), n (%)		All Corporations, n <sup>c</sup> (%)	Small Corporations, <sup>a</sup> n <sup>c</sup> (%)	Medium Corporations, <sup>a</sup> n <sup>c</sup> (%)	
Promotion and program								
1. Conduct assessments of employee's HE through health checkup, etc	138 (54.8)	99 (56.6)	39 (50.6)	0.412	31 (30.7)	23 (33.8)	8 (24.2)	0.367
2. Plan and provide health educational program (seminars, classes) to promote HE	39 (15.5)	23 (13.1)	16 (20.8)	0.133	55 (29.1)	38 (28.1)	17 (31.5)	0.723
3. Provide educational materials (posters, brochures, pamphlets) on improving HE	89 (35.3)	63 (36.0)	26 (33.8)	0.776	59 (40.1)	41 (40.6)	18 (39.1)	1.000
Organizational policies and practice								
4. General statement by the employer about organizational goals and methods for improving HE	44 (17.6)	31 (17.9)	13 (16.9)	1.000	67 (36.4)	46 (36.8)	21 (35.6)	1.000
5. Cafeteria (including delivery box lunch) has healthy options (balanced meals, low-calorie meals, small sizes)	59 (23.4)	30 (17.1)	29 (37.7)	0.001	19 (10.9)	12 (9.2)	7 (15.9)	0.263
6. Cafeteria (including delivery box lunch) has discounts for healthy meals	36 (14.3)	17 (9.7)	19 (24.7)	0.003	18 (9.2)	9 (6.3)	9 (17.0)	0.047
7. Provide incentives (rewards, awards, giveaways) for HE (goal achievement)	3 (1.2)	1 (0.6)	2 (2.6)	0.222	34 (15.6)	21 (13.8)	13 (19.7)	0.311
8. Encourage taking sufficient time to eat lunch; flexible lunch breaks even if work is busy	207 (82.1)	141 (80.6)	66 (85.7)	0.375	13 (34.2)	9 (31.0)	4 (44.4)	0.689
9. Encourage having meals during overtime work (provide light meal, secure meal time)	136 (54.2)	99 (56.6)	37 (48.7)	0.272	24 (23.5)	17 (25.0)	7 (20.6)	0.805
10. Make health promotion programs available to family members for HE	4 (1.6)	3 (1.7)	1 (1.3)	1.000	33 (15.0)	20 (13.2)	13 (19.1)	0.307
11. Encourage reduction of alcohol consumption (have a rest day)	62 (24.7)	47 (27.0)	15 (19.5)	0.266	56 (33.1)	41 (36.3)	15 (26.8)	0.230
Internal physical environment								
12. Display nutrient and calorie information in the cafeteria (including catered lunches)	41 (16.3)	23 (13.2)	18 (23.4)	0.063	22 (12.3)	13 (10.2)	9 (17.6)	0.207
13. Provide equipment for drinking fluids as needed (water server, drinking fountain, staff kitchen)	209 (82.9)	142 (81.1)	67 (87.0)	0.281	11 (26.8)	10 (31.3)	1 (11.1)	0.401
14. Include healthy options (low sugar, low calories, nutritious) in vending machines	125 (49.8)	78 (44.6)	47 (61.8)	0.014	22 (19.8)	15 (17.6)	7 (26.9)	0.398
15. Provide appliances (refrigerator, microwave) and a simple kitchen for cooking or storing meals	220 (87.6)	150 (86.2)	70 (90.9)	0.406	7 (25.9)	6 (27.3)	1 (20.0)	1.000
16. Encourage healthy options at dinners and banquets with employees and coworkers	60 (23.9)	45 (25.7)	15 (19.7)	0.338	43 (25.1)	30 (26.3)	13 (22.8)	0.710
Internal social environment								
17. Have an employee who promotes HE	21 (20.2)	34 (19.4)	17 (22.1)	0.614	60 (34.5)	41 (34.2)	19 (35.2)	1.000
Median	24.7	25.7	24.7		23.9	27.3	22.8	

<sup>a</sup>Small corporation: The number of employees <50, medium corporation: The number of employees ≥50.<sup>b</sup>Fisher exact test.<sup>c</sup>The corporations that did not implement each item.

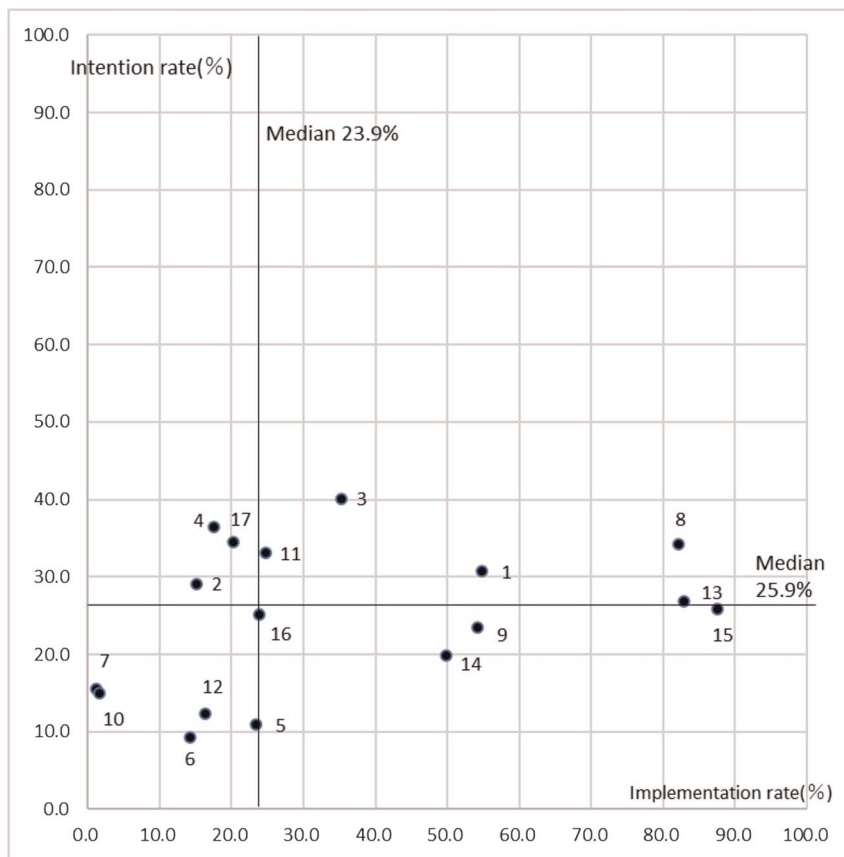


FIGURE 2. Implementation and intention rate of policies and environmental strategies for improving HE.

effective educational materials that match the specific health problems of the corporation and by providing methods that match the corporate environment. Moreover, items “[2] Plan and provide health educational program (seminars, classes) to promote PA/HE” and “[4] General statement by the employer about organizational goals and methods on improving PA/HE” had a low or medium implementation rate and a relatively high implementation intention rate, which was common to both PA and HE. The JHIA-A health professionals can provide assistance in implementing health education and support employers in planning and declaring policies and strategies to improve PA/HE for their employees. The items unique to HE and PA have been elucidated hereinafter.

### Characteristics of Implementation and Implementation Intention Rates in PA Items

Of the items for PA, item “[16] Provide environments for commuting on foot or on bicycle (bicycle storage, parking lot outside the workplace, etc)” had the highest implementation rate (63.8%). However, the implementation intention rate of this item was low in both small and medium corporations. This suggests that the ability to provide an active commuting environment depends on the location of the office. If the workplace occupies a large area, such as in suburban areas, providing an active commuting environment is not challenging. However, it may be difficult for a corporation located in a building in the city to provide sufficient space for bicycle parking for employees and space for parking bicycles and other vehicles at an appropriate distance from the office. Changing the location of a workplace is not practical because there are many factors to consider, such as the nature and form of work as well as cost. Therefore, corporations that could

implement this strategy had already done so, and corporations that found it difficult to implement had little intention to do so in the future. Effective strategies to increase the PA involved in work and leisure time have been suggested for corporations that cannot provide an active commuting environment.<sup>26,27</sup> Walking, using stairs, and carrying a load can be increased without spending additional time for increasing PA, which can help in increasing employee awareness about occupational activities.<sup>26</sup> In addition, because item “[13] Create an environment (stairs, passages, workstation, etc) which increases PA in the workplace” had medium implementation and implementation intention rates, advising the employer about concrete methods for creating an environment that increases occupational activity is effective.

Of the four items in the internal physical environment, implementation and implementation intention rates for item “[14] Provide on-site equipment or facilities for PA (machines, walking and running path, etc)” were low in both small and medium corporations. Furthermore, of the nine items in organizational policies and practice, implementation and implementation intention rates of items “[5] Subsidize or bear the cost of exercise facilities (gym, fitness, etc)” and “[6] Provide exercise equipment, such as pedometers, or financial assistance for purchasing the same” were low in both small and medium corporations. This indicates that setting up exercise facilities in the workplace or providing financial support for engaging in exercise outside the workplace is difficult. Comparatively, regarding organizational policies and practice, implementation rates of items “[8] Campaign or competitions to promote PA (encourage to use stairs, etc)” and “[9] Conduct exercises and stretching at scheduled times at the workplace” were higher than other items in both small and medium corporations.

In addition, the implementation intention rate for these items was relatively high. Employee participation raises their awareness of health behaviors and helps build relevant skills.<sup>28</sup> To this end, employee interest in improving PA is one way to overcome cost barriers.<sup>29</sup> As these items are practical strategies that do not require much cost and investment to improve the environment, it is feasible and acceptable to recommend these strategies to small and medium corporations.

The implementation rate of small corporations was lower than that of medium corporations for all eight items that had significant differences. Thus, because of financial barriers and human resources, it is difficult for small corporations to implement these items. Comparatively, there was no significant difference in the implementation intention rate between small and medium corporations, except for item “[15] Provide lockers room/showers for PA.” Although there was no significant difference in the three items that had high implementation intention rates, the implementation intention rate of small corporations was higher than that of medium corporations. This result indicates that employers of small corporations are more interested in health management. Although small corporations may have cost and human resource barriers, they have the advantage that health policies from top management can be easily disseminated to employees.<sup>30</sup> Thus, it is important to support interested top managers in implementing policies and environmental strategies to improve PA. It is vital that top management who are not interested in health promotion in the workplace are educated of the importance of promoting policies and environmental strategies for employees’ health as a necessary management strategy.

### Characteristics of Implementation and Implementation Intention Rates in HE Items

Of the items for HE, items “[15] Provide appliances (refrigerator, microwave) and a simple kitchen for cooking meals” and “[13] Provide equipment for drinking fluids as needed (water server, drinking fountain, staff kitchen)” had high implementation rates of 80% or more. In Japan, it is common for staff kitchens to have a cooking stove or hot water supply, and workplaces are equipped with refrigerators. This is due to the existing workplace culture of bringing lunch boxes to the office or serving tea to business visitors. Therefore, these items may be easy to implement with little preparation and investment. Moreover, item “[8] Encourage taking sufficient time to eat lunch; flexible lunch breaks even if work is busy” had a high implementation rate of 81.7%. A previous study reported that meal skipping is related to time scarcity.<sup>30</sup> Another study<sup>31</sup> reported that temporary workers skipped meals more often than permanent workers, suggesting that working conditions are affected by meal skipping. This item can be implemented easily, without much cost, if the employer understands the need for HE. In addition to encouraging employers to set up work arrangements that allow them to have time for lunch, employees must be educated on the importance of having three meals a day.

The implementation rates of items “[5] Cafeteria (including delivery box lunch) has healthy options (balanced meals, low-calorie meals, small sizes)” and “[6] Cafeteria has discounts for healthy meals” were low; implementation rates of these items in small corporations were significantly lower than those in medium corporations. Evidently, medium corporations may be able to set up a cafeteria in the workplace, but the same is difficult for small corporations as it is not profitable. The implementation intention rates of these two items were low for both small and medium corporations. Furthermore, there was a limited number of corporations who intended to implement these strategies. Most corporations consider that it is challenging to provide healthy meals in their employee cafeteria, which too at a discounted price. Similarly, the implementation rate of item “[14] Include healthy options (low sugar, low calories, nutritious) in vending machines” was significantly lower in small corporations than in

medium corporations. Because of the limited number of vending machines in small corporations, offering a variety of healthy options in vending machines may be difficult. Implementation intention rates for this item were low for both small and medium corporations. As represented by convenience stores, there are many eating options outside the office, with more than 55,000 convenience stores that sell many kinds of food, including healthy options, in Japan.<sup>32</sup> Thus, employers consider that it is unnecessary to provide healthy options at the workplace. A previous study reported that the higher the ratio of grocery and produce vendors to fast food and convenience stores in a residential setting, the lower the probability of obesity.<sup>33</sup> Other studies have revealed that the perceived availability of healthy food options increases fruit and vegetable intake.<sup>34,35</sup> Moreover, the presence of different types of food retailers around the office depends on the area. Thus, to promote HE among employees, it is important to educate them on what foods are healthy and where to find retail stores that sell healthy foods outside the workplace.

The analysis of the data from the free-form answers regarding policies and environmental strategies for promoting PA/HE revealed five themes for PA and four themes for HE. The number of respondents that responded to the free-form answers was small. This implies that few corporations implemented strategies other than those listed in the questionnaire. However, the policies and strategies that were obtained are helpful in formulating new feasible strategies for small and medium corporations.

In conclusion, this study investigated the implementation status of policies and environmental strategies for increasing PA and HE among small and medium corporations that engaged in organizational strategies for health promotion at the workplace. Overall, this study’s findings clarified the realistic implementation status of strategies that have been confirmed to be effective in previous experimental studies. Despite these important findings, our study has several limitations. First, the recovery rate was low at 39%, and there may have been a nonresponse bias. That is, the corporations that responded were highly motivated; thus, the actual implementation rate may be lower than what the results of this study indicate. Second, as this study targeted corporations that participated in the Healthy Declaration Program and had engaged in organizational strategies for health promotion at the workplace, the results of this study may not be generalizable to small and medium corporations. Third, we did not investigate various characteristics of the corporations, such as overtime hours, working pattern, and ratio of white- and blue-collar workers. Hence, this study cannot elucidate the impact of these characteristics on the feasibility and acceptability of policies and environmental strategies for increasing PA and HE. Fourth, there were variations in the evaluations of implementation status because the questionnaire was self-administered. In future research, an empirical study is needed to determine whether policies and environmental strategies for increasing PA and HE are considered feasible and acceptable. Furthermore, further studies are needed to determine whether the policies and strategies found feasible and acceptable in this study are easy to implement, even for corporations that have not yet implemented them. Overall, this study revealed important insights regarding implementation and implementation intention rates in small and medium corporations and suggested that employee participation must be encouraged, and employee knowledge of PA and HE must be improved to overcome barriers to implementation.

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