



Original article

Policy, environment, and worksite fitness program participation among financial enterprise employees in Taiwan

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Abstract

Background/Objective: This study explored the intertwined effects between the policies and regulations of the companies and personal background on participation in the physical fitness programs and leisure-time activities in financial enterprises.

Methods: A total of 823 employees were selected as the sample with the multilevel stratification random-sampling technique. The response rate was 52.0%. Data were analyzed with descriptive statistics and hierarchical linear logistic regression.

Results: Thirty-two percent and 39% of the employees participated in the physical fitness programs and leisure-time activities, respectively. The factors affecting participation were categorized into intrapersonal factors, interpersonal processes, and primary groups, as well as institutional factors. In the interpersonal processes and primary groups level, higher family social support, more equipment in health promotion was associated with more participation in the programs. With the influence from the institutional level, it was found that health promotion policy amplified the relationship between employees' age and participation, but attenuated the relationship between education level and participation. Health promotion equipment in the institutes attenuated the relationship between colleague social support, family social support, and education level with program participation. Physical activity equipment in the community attenuated the relationship between family social support and program participation.

Conclusion: The influential factors of social support and worksite environment could predict the employees' participation in the physical fitness programs and leisure-time physical activities. Health promotion policy and equipment attenuated the negative effects of nonparticipation as well as amplified the positive effects of participation.

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Keywords: Health promotion equipment; Health promotion policy; Physical fitness; Workplace health promotion

Introduction

With the emergence of a new era in public health, the goal of health promotion has been adopted in many countries. As employed adults spend at least one-third of their daily life at work, workplaces provide a logical setting in which the environment might be shaped to promote healthier behavior

and improve employees' lifestyles. Workplace health promotion is not limited to traditional hazards control and disease prevention; rather, promoting employees' health-related behavior before the onset of disease is the new focus. Research has indicated that employees who participate in health-promoting programs not only have less absenteeism, sick leave, and reduced medical care cost, but also have higher overall morale.^{1,2} Meanwhile, employees are under new health risks because of changes in the style of labor and occupational patterns resulting from the globalized economy and swift changes in scientific technology. Based on research on workplace health and safety conducted by the Taiwan National

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Labor Commission,³ 31% of workers interviewed believed that their workplace environment had a negative effect on their health. More than 60% of the interviewees claimed that they had workplace-related discomfort; > 50% had physical pain; and 34% had poor quality of sleep. Among those interviewed, employees of financial and insurance companies felt they had the highest amount of pressure from work. Financial enterprises play an important role in national economies. A stable financial system can improve the growth and development of a country; meanwhile, international financial crises can occur because of the systemic failure in one country. Thus, the importance of this business can cause great stress for employees. A study of 38 managers and 1326 staff in Taiwan⁴ found that the respondents, both managers and staff, did not live an active lifestyle. Only 26.4% of them exercised three times a week and 38.2% engaged in leisure-time physical activity during holidays. Sixty percent of the managers and 50% of the staff did not have a balanced diet or eat two servings of fruit per day. A physically inactive lifestyle paired with the sedentary work pattern of the financial institute workers might cause the problem of obesity for this employment group.

Obesity is one of the most important factors underlying many diseases, and is a growing problem worldwide. Recent statistics indicated that 1 billion people worldwide were overweight, with 300 million classified as obese.⁵ Adults were at continued risk for weight gain over time, with average increases of two pounds per year.⁶ Energy expenditure is important for weight control as well as obesity prevention. Public habits have not changed to a great degree, although it is well known to most people that regular physical activity and leisure-time activities help with people's health. A study conducted in Northern Ireland⁷ indicated that even a short-term health promotion intervention project can improve the lifestyle of the employees. Taiwanese enterprises have implemented many health-promoting programs with support from the government in recent decades on tobacco control, physical fitness, preventive screening, health education, healthy diet, and stress management.⁸ Among these, the most popular projects were fitness activities and leisure-time activities.⁹ Thus, it is worthwhile to explore the factors that influence employees to participate in future programs.

McLeroy and colleagues¹⁰ proposed an ecological model identifying five specific levels of influence as the most relevant for explaining and changing health behavior, that is, intrapersonal factors, interpersonal processes and primary groups, organizational factors, community factors, and public policy. Studies have indicated that sex and socioeconomic status are associated with participation in health promotion programs. Women and those with higher salaries participated more than men and those with lower salaries.^{11,12} A systematic review by Robroek et al.¹³ also found contradictory results for age, with both statistically significant higher and lower participation levels among older employees. The authors further indicated that few studies evaluated the influence of health, lifestyle, and work-related factors on participation, which is an obstacle for insight into underlying

determinants of initial participation and sound program planning.

Despite the importance of the organizational sciences, little is known about the extent to which organizational behavior and work-related well-being can be explained by environmental factors and by employees' personal background. To date, no study has explored the influence of company policies and regulations on participation, although these factors are important. In this paper, we report and discuss our in-depth exploration of personal and organizational factors influencing workers' likelihood of participating in fitness programs, as well as the environment for physical activity inside the workplace and in the surrounding areas based on a social ecological model that might be associated with participation.

Methods

The research proposal was reviewed and approved by a review board appointed by the Health Promotion Administration, Ministry of Health and Welfare, Taiwan. The board members also examined the ethical issues without any negative comments. Informed consent was received from the participants to safeguard the rights of the participants.

Participants and procedure

This study was an institution-based survey. This involved a stratified clustering sampling design based on company size to select a nationally representative sample. The target population for the survey was the employees in any one of the 1346 financial institutions in Taiwan. All employees who worked at these financial institutions were eligible to complete the questionnaire. The institutions were categorized into small, medium, and large companies based on the criteria set by the Commission of Labor and the World Bank. Sample size was estimated by using the formula of standard error with $\alpha = 0.05$, $Z = 1.96$, and maximum sampling error = 0.05. Companies were drawn proportionally within each category. Among the 1346 registered institutions with 47,069 employees, two from 64 medium-sized companies and 29 from 1282 small companies were selected. A total of 31 companies were sampled, representing 823 persons. Respondents completed the questionnaire at the company and returned it in an envelope to the research team, providing a total sample of 428 participants (52.0% response rate).

Measures

Outcome variables

Two types of fitness program participation were self-reported. Taking part in physical fitness and leisure-time physical activity programs offered by the workplace was assessed using the following question: "Have you ever participated in any sport or exercise activities held by the company?" Respondents were asked to identify the types of physical activity they had engaged in from 12 named activities, for example, physical fitness, sporting games, and

basketball. The response options were “knew about but did not participate”, “knew about and participated”, “did not know about”; and “activity was not held in the office.” Consistency of the program participation question was 0.86, while κ scores for repeated measures ranged between 0.42 and 0.47, demonstrating acceptable reliability.

Individual-level variables

Based on previous studies, potential confounders at the individual level were identified as sociodemographic factors: sex, age, educational level attained (primary, secondary, college, research institute, and above), and annual income (in New Taiwan Dollars: \leq NT\$500,000, NT\$500,001–1,500,000, NT\$1,500,001–2,000,000, \geq NT\$2,000,000).

Interpersonal interaction and main group variables

Informational, appraisal, emotional, and evaluation support from family as well as intimacy, mutual support, respect, and caring from colleagues were assessed. Cronbach α reliability coefficient for the seven-item family support and 13-item colleague support was 0.92 and 0.94, respectively.

Organizational factors

Three kinds of organizational variables were identified. (1) Health-promotion policy: the administrators were asked to specify the following six items (yes/no), such as: “Did the company clearly explain the health promotion programs?”; “Was the policy signed by the highest administration level?”; “Was there a budget for the program?”; “Were there items of health promotion in the job description for the administrators and the staff?”; “Were there personnel responsible for health promotion?”; “Did participation in health-promoting programs help employees promotion in their career at the company?”; and Cronbach α reliability coefficient for the six items was 0.82. (2) Health promotion facilities and equipment inside the institution reported by the administrators. Cumulative scores were calculated. (3) Facilities and equipment for physical activity in the surrounding areas of the community such as walk trails, parks, sports courts, recreation gardens, and fitness clubs. The cumulative score was also calculated.

Data collection and analysis

Managers in the human resources office of the company were contacted in person or by telephone to gain approval to conduct the study. The instructions were attached to the questionnaires for the managers to distribute and collect the questionnaires and mail them back to the research office. The managers also filled out the questions at the organizational level as mentioned above. Analyses were conducted using SPSS version 21.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to characterize the participants as well as the institution and the surrounding environment in the community. Cross-tabulation of the relationship between participation and individual, and institution and community variables was conducted. Pearson-moment correlation tests were used to identify the underlying correlation. Because of the nested

nature of the data (individuals within organizations), intra-class correlation coefficients were calculated to determine the degree of institution-level clustering. Hierarchical generalized linear model logistic regression, with participation in the program as the dependent variable, was conducted to determine the effects of group-level and individual-level variables.

Results

Participant characteristics

Table 1 lists the number and percentage of the socioeconomic and demographic characteristics of the participants. Respondents were mainly female (60.8%), aged 25–44 years (55.6%), married (58.7%), with a college-level education (72.6%), and annual income between NT\$500,001 (~US\$16,700) and NT\$1 million (~US\$33,300; 45.1%).

Equipment for health promotion in the workplace

Drinking water facilities topped the list of facilities for health promotion (74%), followed by workout equipment (22.2%), and rooms for the workers to take a rest (14.8%), and facilities for exercise such as a sports court (11.1%).

Facilities for physical activity in the nearby community

Parks were the most-mentioned facilities (33.3%), followed by open space in the nearby schools (25.9%), a walking track for pedestrians (22.2%), activity center in the community (14.8%), sports courts (11.9%), and sports clubs (7.4%)

Table 1
Sociodemographic variables of the 428 employees.

	%
Sex	
Male	39.2
Female	60.8
Age (y)	
15–24	21.6
25–44	55.6
45–65	20.3
\geq 65	3.5
Education	
Primary school, junior high school	0.9
Senior high (vocational) school	23.3
Junior college, college	72.6
Masters & above	2.8
Marriage status	
Unmarried	37.7
Married	58.7
Divorced/widower	3.5
Annual income	
\leq NT\$500,000	31.7
NT\$500,001–1,000,000	45.1
NT\$1,000,001–1,500,000	16.7
\geq NT\$1,500,001	6.5

Determinants of participation in workplace physical fitness programs

The employees who knew about and attended the programs comprised most of the workers (76.7%). Around a quarter (23.3%) neither knew about nor participated in any programs. This study differentiated the employees who knew about and participated in the activities from those who knew about but did not participate in the activities. It was found that organizational factors could explain the variance of employees' participation (intra-class correlation = 0.22, $p < 0.001$) by using a hierarchical generalized linear model. There was a significant difference in the participation rate of employees from different organizations ($\chi^2 = 47.63, p < 0.01$). It was found that support from the family made a significant difference ($t = 2.48, p < 0.05$) by using logistic regression (Table 2). The more family support, the higher the possibility that the employees would take part in the programs. Also, the more equipment the organization had, the employees were more likely to participate. It was estimated that if the equipment increased one unit, the odds ratio for participation increased 3.02 units.

The sociodemographic variables such as sex, age, educational level, yearly income, and regular exercise habits were not associated with participation.

Analyzing the interaction effect between group level and individual level, it was found that a health promotion policy increased the likelihood that older employees would participate in health promotion programs ($t = 3.47, p < 0.01$); meanwhile, having such a policy in place resulted in a statistically negative relationship between educational level and participation ($t = -4.07, p < 0.01$), indicating that more employees were joining fitness activities regardless of possible low education level. Physical activity equipment in the company decreased the importance of educational level ($t = -4.21, p < 0.001$) and “support from colleagues”, ($t = -3.53, p < 0.01$) as factors in employees' participation, meaning that with more equipment available in the workplace, employees took part in fitness activities regardless of education level or social support. The same was true for support from families ($t = -2.79, p < 0.05$) as a factor in

participation; with more fitness equipment in the community, more employees took part in fitness activities, regardless of family support (Table 3).

Without considering the interaction effect of group level and individual level variables, support from families and equipment in the company had a positive effect on participation. Taking the interaction effect into consideration, a health promotion policy had a stronger positive effect on encouraging older workers to join fitness activities. The original nonsignificant positive relationship between education and participation turned out to be negative, that is, with a policy in place, less-educated employees were more likely to participate in fitness programs, compared to a situation with no policy, in which employees with higher educational attainment were more likely to join fitness activities. Also, it was found that if fitness facilities were available at the workplace and in the

Table 3
Effect of organization factors with individual factors on program participation.

	γ effect	Standard error	Estimated t ratio	p
Health promotion policy				
Sex	0.29	0.26	1.10	0.28
Age	0.05	0.01	3.47	<0.001
Education level	-1.92	0.47	-4.07	<0.001
Yearly income	0.29	0.14	2.02	0.06
Regular exercise	0.29	0.24	1.11	0.26
Family support	-0.03	0.01	-1.75	0.09
Colleague support	-0.01	0.02	-0.62	0.54
Fitness equipment in the company				
Sex	0.36	0.67	0.53	0.60
Age	0.05	0.03	1.40	0.18
Education level	-1.88	0.45	-4.21	<0.001
Yearly income	0.50	0.45	1.10	0.28
Regular exercise	0.33	0.43	0.50	0.40
Family support	-0.12	0.04	-2.79	<0.01
Colleague support	0.12	0.03	-3.53	<0.001
Fitness facilities in the community				
Sex	-0.09	0.37	-0.25	0.80
Age	-0.03	0.03	-0.77	0.45
Education level	-0.53	0.28	-1.91	0.07
Yearly income	0.11	0.38	0.30	0.77
Regular exercise	-0.02	0.03	-0.56	0.45
Family support	-0.07	0.03	-2.22	0.04
Colleague support	-0.04	0.02	-1.58	0.13

Table 2
Logistic regression of employee program participation.

Fixed effect	γ coefficient	Standard error	Estimated t ratio	p	Odds ratio	Confidence interval
Sex	-0.10	0.37	-0.28	0.78	0.90	0.42–1.93
Age	0.00	0.03	0.11	0.91	1.00	0.95–1.07
Education level	0.76	0.51	1.50	0.15	2.14	0.75–6.12
Yearly income	-0.19	0.27	-0.68	0.50	0.83	0.47–1.46
Regular exercise	0.56	0.51	1.50	0.15	1.74	0.74–2.74
Family support	0.08	0.03	2.48	0.02*	1.09	1.01–1.16
Colleague support	-0.01	0.03	-0.47	0.64	0.99	0.93–1.05
Health promotion regulation	-0.17	0.61	-0.27	0.79	0.85	0.24–2.99
Health promotion policy	-0.17	0.13	-1.31	0.20	0.84	0.64–1.10
Fitness equipment in the company	1.11	0.37	3.03	0.01*	3.02	1.42–6.43
Fitness facilities in the community	-0.24	0.16	-1.55	0.13	0.78	0.57–1.08

* $p < 0.05$.

nearby community, social support from the family was a less important factor in determining employee participation. Obviously, convenient facilities outweighed social support as a factor in increasing participation. Facilities gave the employees who were short of social support a place to go.

Discussion

This is the first reported study exploring factors associated with participation in workplace health promotion programs in a Chinese-speaking population. Also, it is a pioneer study differentiating the influence of group-level variables and individual variables. Results of this study showed that 30–40% of employees participated in physical fitness and leisure health promotion programs, which is consistent with a previous systematic review¹³ that found participation levels in health promotion interventions in the workplace were typically below 50%. Meanwhile, 23% of the surveyed employees of financial institutions have never participated in physical fitness and leisure health promotion activities sponsored by any organization. Quid and Liu⁸ conducted a survey on workplace health promotion activity types, and found that the health promotion activities most desired by employees are leisure activities and exercise. This suggests that there remains room for improvement as financial institutions seek to encourage employees to participate in physical fitness and leisure health promotion activities.

This study used the social ecology model to explore factors that affect workplace physical fitness and leisure health promotion activities. Research has shown that interpersonal interactions, “family support” in the main group system, and “equipment relating to health promotion activities in the institution” in the institutional system, are important factors influencing employees at financial institutions to participate in physical fitness and leisure health promotion activities. This finding is consistent with previous studies indicating that environmental or contextual factors in the workplace are important determinants of participation,^{14,15} which suggested that family encouragement and companionship, or the convenience and accessibility of equipment relating to such activities, could lead to greater sustainability in personal participation in fitness activities. Thus, family support, comprehensive health promotion, and activity facilities can be used to increase employee motivation for participation in physical fitness and leisure health promotion activities.

In the present study, fitness facilities were an important factor for health promotion activities. Unfortunately, due to budget and space limitations, nearly half of small corporations only had employee tea rooms, while 60% of large corporations had a variety of facilities such as medical centers and employee tea rooms. These results showed that the facilities of most financial institutions do not meet the employees' needs for health promotion. This lack of facilities is a serious problem as it was shown that 98% of the enterprises surveyed were small businesses. Since the work of employees at financial institutions is sedentary and does not require much physical energy, studies have shown that employees need more

exercise.^{4,7} If such institutions do not encourage activities relating to physical fitness and leisure health promotion, and do not provide incentives through leisure equipment within the institution, it is difficult for employees to form good exercise habits on their own, which can harm their health in the long run. When there is insufficient exercise and leisure equipment in an institution, employees can make up for this by using facilities in the community to which the institution belongs. The facilities mentioned most are parks nearby workplaces, but they only accounted for 38.2%. The low ratio of facilities warrants improvements in urban and community space planning.

Another interesting finding is that organizational factors can strengthen or weaken the possibility of activity participation influenced by personal social demographic variables. For instance, senior workers were more likely to participate in fitness activities if there was a policy in the workplace that encouraged employees to exercise. This confirms the importance of the health promotion policies of the organization in strengthening this correlation. Thus, institutions can establish strategies for older employees to enhance their motivation for participating in physical fitness and leisure health promotion activities. Another finding was that having fitness equipment available in either the workplace or the community reduced the influence of social support on participation in fitness activities. In other words, when the organization has sufficient equipment for employee leisure and exercise, whether there is support from family and colleagues is not as important. In addition, health promotion policies within the organization and equipment in the organization can increase the rate of employee participation in fitness activities regardless of education level. In other words, employees with lower education levels require more comprehensive health promotion strategies and relevant facilities to encourage their participation in physical fitness and leisure health promotion activities.

Like many other studies at worksites, this study had a valid response rate of slightly higher than 50% from employee samples due to the hectic schedule of the employees. Since the questionnaires were directly given to employees by department directors, the Hawthorne Effect could not be prevented. In view of this, when applying the results of this study, it is necessary to note the range of extendibility of external validity.

In conclusion, 30–40% of the employees participated in physical fitness and leisure health-promotion programs, as found in other studies. Sociodemographic variables of individual employees were not significant determinants of participation. Interpersonal interactions, for example, family support and equipment at workplace are important factors influencing employees at financial organizations to participate in physical fitness and leisure health promotion activities. In the organizational system, the factor of “health promotion policies about physical activity in the institution” increased the willingness of older employees to participate in physical fitness and leisure health promotion activities. Interestingly, when the institution had sufficient facilities for employee leisure and exercise activities, support from family and

colleagues was not as important. For employees with less education, it is necessary to have comprehensive strategies and relevant equipment to encourage them to participate in fitness programs. Unfortunately, the equipment and facilities at workplaces and in nearby communities were found to be insufficient; a situation that warrants further attention to space allocation as well as urban and community planning.

Guidelines should be established to help corporations set up workplace health promotion policies to encourage employee participation in physical activity programs. Establishment of workplace health promotion policies strengthens the motivation of those already participating in such activities, such as older employees, and enhanced physical activity facilities in organizations would further encourage participation. With these changes, corporations would have healthier workers able to face market changes and intense challenges in the future. Another possible direction for consideration is encouraging employees to take advantage of fitness facilities in the neighborhood to be physically active.

Conflicts of interest

The authors declare that they have no competing interests.

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